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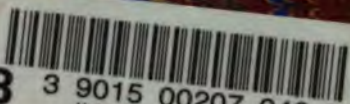
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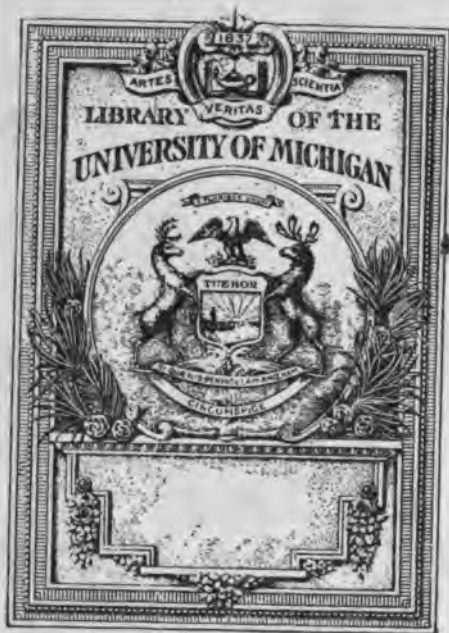
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THE ZOOLOGIST:



A MONTHLY JOURNAL

OF

NATURAL HISTORY.

FOURTH SERIES.—VOL. VIII.

EDITED BY

W. L. DISTANT.

LONDON:

WEST, NEWMAN, & CO., 54, HATTON GARDEN,
SIMPKIN, MARSHALL, & CO., LTD.

1904.

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PREFACE.

THE present volume more than maintains its interest and importance in the details of British Zoology. This is particularly the case with the Mammalia, and we cannot but allude to the description by Mr. Millais of a new species of Vole from the Orkney Islands. To discover a mammal new to Britain, and that an undescribed species, is at the present day more extraordinary than unearthing the remains of some extinct monster hitherto unknown to Palæontology.

The most important record added to the tale of our British Birds has been communicated by Mr. Aplin, and relates to the breeding of the Black-necked Grebe (*Podiceps nigricollis*) in these islands. A paper on the measurements and weights of the eggs of the commoner *Charadriidæ*, by the Messrs. Buchanan, affords not only valuable data, but almost denotes a fresh field for investigation in oology.

In Pisces, Mr. Patterson has commenced an annual report on Norfolk fishes, and we hope that this communication will promote similar records from other parts of our coasts.

The "Story of a Pearl," by Prof. McIntosh, has focussed attention on some lower forms of animal life, and shows what a vast field still awaits the observations of marine zoologists. Material for bionomical investigation is far from being exhausted in these islands, and a wealth of material still awaits the arrival of more workers.

In our next volume we are promised a series of monthly reports from our London Zoological Gardens, written by one

than whom there is no more qualified contributor on that subject.

'THE ZOOLOGIST' increases its circulation in our Greater Britain, and colonial naturalists make use of its pages. Mr. Littler's memoir on the Birds of Tasmania affords an object-lesson.

There remains one subject apparently eschewed by our contributors: we refer to British Anthropology. If "the proper study for mankind is Man," the axiom seems at least to be not sufficiently appreciated, and the subject too often regarded as outside Zoology.



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THE ZOOLOGIST

No. 751.—January, 1904.

THE PLACE OF HERBERT SPENCER IN BIOLOGY.

BY D. SHARP, M.A., M.B., F.R.S., &c.

THE 'System of Philosophy,' of which Herbert Spencer was the author, deals with Ethics, Psychology, and human Sociology, as well as with Biology. The pages of 'The Zoologist' are not the place in which to appraise the merits of his 'System' as applied to the more transcendental divisions of Philosophy. We shall here only deal with his claims as a Biologist; and we shall show that in the history of this science he will occupy a place between Lamarck and Charles Darwin—the men who, nobly aided by Wallace and Huxley, made it possible for their intelligent fellows to entertain a sure conviction that Biology is truly a Science, and that all its branches are legitimate subjects of inquiry, just as are the sciences of Astronomy and Chemistry. Previous to the exertions of the men we have named this was not admitted by the human Society.

It is now nearly one hundred years* since Lamarck published his 'Philosophie Zoologique,' in which the idea of the permanence of specific distinctions was impugned, and an attempt was made to give philosophical reasons in justification of the opposed view of transformism.

Lamarck's effort was opposed by the great influence of Cuvier, and for half a century "permanence" was apparently nearly

* Paris, A.D. 1809.

supreme amongst educated men, and was accepted—at any rate, nominally—by zoologists. Then in the middle of the nineteenth century came Spencer, Wallace, and Darwin, and the first of these in point of time was Spencer. Since the appearance of the works of these great men “transformism” or “evolution” has acquired a place in Philosophical Biology, from which it is certain it will never be deposed, however much views as to the actual nature of the transformism may differ.

At the present time the efforts of biologists are directed to discovering the mechanism by which transformation actually takes place. Herbert Spencer applied his idea of evolution (as a continued cosmic change that is constantly, if not uniformly, going on) to living creatures, including the structure and activities of man himself. His works have been largely studied all over the world, and have contributed greatly to the diffusion of the idea that plants, animals, and man are the results of natural laws, partly the same as, and partly comparable with, those that have modelled the features of inorganic nature.

I have said that Spencer was in point of time the first of the recent great transformist naturalists of the nineteenth century. We shall probably learn from his autobiography when he first conceived the idea of one set of natural laws governing all phenomena. But we can learn from his writings that in 1852 he was sympathetically disposed towards the “development hypothesis,” and that in 1854 he had a vague notion of Evolution as a general phenomenon. In 1854 he became intimately acquainted with Huxley, and thereafter his ideas underwent a rapid and great development; so that in 1857, in his *Essay on Transcendental Physiology*, we find a really adequate statement of his views on Organic Evolution. Here he tells us that the inheritance of acquired characters is possibly “the universal law; comprehending not simply those minor modifications which offspring inherit from recent ancestry, but comprehending also those larger modifications, distinctive of species, genus, order, class, which they inherit from antecedent races of organisms.” And, again, in the same essay:—“We might almost say that just as some original race of animals, which multiplies and spreads into different regions of the earth, becomes differentiated into several races through the adaptation of each to its conditions

of life ; so, the originally homogeneous population of cells arising in a fertilized germ-cell becomes divided into several populations of cells that grow unlike in virtue of the unlikeness of their circumstances."

Thus, in 1857, Spencer clearly laid out his principles of Biology. In his subsequent great work on the subject he merely amplified, and considered from various points of view, the doctrine of this Essay on Transcendental Physiology.

Great misconception has prevailed as to the relations of the doctrines of Charles Darwin and Herbert Spencer. These we may deal with briefly. The first publication by Darwin and Wallace of the views that have made them so famous took place in 1858, a year after the appearance of Spencer's work. Hence Spencer could not have derived his ideas from them. Moreover, though the teachings of the two men—Spencer and Darwin—are constantly confounded, they have really little in common, except that both are endeavours to promulgate the truth of "transformism."

The first indication we find of Spencer being acquainted with Darwin's views is the note on p. 404 of the first edition of 'First Principles,' published in March, 1862. This note is of so much importance that we will quote it in full. It runs :—" Had this paragraph, first published in the 'Westminster Review' in 1857, been written after the appearance of Mr. Darwin's work on the 'Origin of Species,' it would doubtless have been otherwise expressed. Reference would have been made to the process of 'natural selection' as greatly facilitating the differentiations described. As it is, however, I prefer to let the passage stand in its original shape ; partly because it seems to me that these successive changes of condition would produce divergent varieties or species, apart from the influence of 'natural selection' (though in less numerous ways, as well as less rapidly) ; and partly because I conceive that in the absence of these successive changes of condition 'natural selection' would effect comparatively little. Let me add that, though these positions are not enunciated in the 'Origin of Species,' yet a mutual friend gives me reason to think that Mr. Darwin would coincide in them ; if, indeed, he did not consider them as tacitly implied in his work."

Here Spencer makes it tolerably clear that he attacked but

little importance to Natural Selection—the leading idea of Darwin's earlier teaching. Later on he proposed to substitute for "Natural Selection" the term "Survival of the Fittest." Concerning this Spencer published another very important note; it is on p. 530 of vol. i. of the 1898 edition of the 'Principles of Biology,' and runs:—"It will be seen that the argument naturally leads up to this expression—Survival of the Fittest—which was here used for the first time. Two years later (July, 1866) Mr. A. R. Wallace wrote to Mr. Darwin, contending that it should be substituted for the expression 'Natural Selection.' Mr. Darwin demurred to this proposal. Among reasons for retaining his own expression, he said that I had myself, in many cases, preferred it—'continually using the words Natural Selection' ('Life and Letters,' &c., vol. iii. pp. 45-6). Mr. Darwin was quite right in his statement, but not right in the motive he attributed to me. My reason for frequently using the phrase 'Natural Selection' after the date at which the phrase 'Survival of the Fittest' was first used above was that disuse of Mr. Darwin's phrase would have seemed like an endeavour to keep out of sight my own indebtedness to him, and the indebtedness of the world at large. The implied feeling has led me ever since to use the expressions Natural Selection and Survival of the Fittest with something like equal frequency."

These facts are sufficient to emphasize the independence of the views of the two men. Spencer continued to be polite to Darwin; and the latter, in the historical sketch prefixed to the later editions of 'Natural Selection,' actually made Spencer's priority over himself appear greater than it really was by attributing the origin of Spencer's 'System' to 1852 instead of 1857.

Certainly the two terms were not worth fighting about. The two great French biologists, Le Dantec and Delage, have expressed their opinions of the terms very clearly. Delage says of Natural Selection, in his work 'L'Hérédité,' the analytical portions of which are of the highest merit, "Ici comme partout, la sélection naturelle en ne laissant vivre que ce qui est apte à vivre donne l'illusion du providentiel." And Le Dantec adequately disposes of "Survival of the Fittest" by pointing out that, as we can define the "Fittest" in no other way than "the one that

survives," the term merely amounts to the indisputable truism of "the survival of the one that survives."

No controversy ever took place between Spencer and Darwin, each invariably preserving a courteous demeanour to the other. Spencer, indeed, was by many supposed to be a mere plagiarist from Darwin, and the misrepresentations that became current gave Spencer much annoyance. He, however, contented himself with the lucid and dignified vindication contained in the preface to the fourth edition of 'First Principles,' dated May, 1880, as regards which we need only say that it sets forth the facts we have already presented to the reader, having drawn them from a survey of the documents themselves.

We have already indicated that there existed, from their first inceptions, serious divergencies between the views of Darwin and Spencer. After Darwin's death these discrepancies were rapidly brought into prominence by means of the writings of Professor Auguste Weismann, of Breslau, and thus were established the two schools of thought that have since been known as "Neodarwinian" and "Neolamarckian," Weismann being the exponent of Neodarwinism, and Spencer the champion of Neolamarckism.

Weismann is a man of great learning in Zoology, a most wonderful observer, with a great power of exposition. When, therefore, about the time of the death of Darwin, he came before the public with a demonstration of the insufficiency of the evidence in favour of the transmission of "acquired characters," this caused some serious anxiety to Spencer; and when it was followed by other essays, extending the influence of "Natural Selection" to fields in which it had not been recognized by Darwin as operative, Spencer was thoroughly roused, and opposed Weismann in a series of articles that were written when he was seventy-three or more years of age. One of his articles was entitled "The Inadequacy of Natural Selection," and it was followed by one from Weismann, styled "The All-sufficiency of Natural Selection."

It is not possible for us to summarize this controversy so far as the statement of Weismann's views is concerned.* It is

* Those who may be desirous of following a critical summary of Weismann's views will find it in Delage's 'l'Hérédité,' 2nd edit. Paris, 1903.

sufficient to say that he accompanied his critical views by a constructive theory that involved great difficulties, and that will certainly be abandoned.

The controversy between these two great men has been of considerable advantage; and though biologists are, many of them, still inclined to take one side or the other, yet on the whole they have profited, inasmuch as they have thoroughly realized the necessity of replacing theory and argument as to inheritance, by the observation of facts.

Enough has been said. The influence of Herbert Spencer on Biology has been great and good, and though his argumentations will many of them be sooner or later replaced by demonstrated facts, yet his position is, as we said at the outset, an historical one, between Lamarck and the modern school.

NOTES ON THE BIRDS OF ANGLESEA.

BY T. A. COWARD & CHARLES OLDHAM.

In the spring of 1903 we again visited Anglesea,* working the whole of the coast-line between Pentraeth and Carmel Head, and spending several days inland in North-east and North Anglesea, besides paying flying visits to Penmon, Puffin Island, Malldraeth, and Newborough. During the whole of our visit, which extended from the middle of May until the end of the first week in June, we had the companionship of Mr. S. G. Cummings, to whose power of observation and intimate knowledge of bird-notes anything of interest in this paper is largely due. Mr. Cummings has kindly placed at our disposal his notes of previous visits to the island. Although the spring had been cold and backward, we were fortunate in having a spell of excellent weather during most of our visit; indeed, some of the days were unpleasantly hot.

North Anglesea differs greatly in character from the country lying to the east of a line drawn from Point Lynas to Llangefni; considerable plantations at Llys Dulas, Lligwy, Parciau, Tyn-y-gongl, and Pentraeth, together with the many limestone terraces, often clothed with dense thickets of hazel and thorn, give the eastern portion a character similar to that of the wooded Straits; but, with the exception of small clumps of shade-trees round the larger farms, North and North-east Anglesea is practically treeless. It supports, nevertheless, a rich and varied flora, save in such places as Parys Mountain, where the copper mines and works have desolated the neighbourhood from the naturalist's point of view.

Parys Mountain is one of the largest of the rocky outcrops or "mynyddau" so characteristic of the island. Three others rise to a considerable height above the surrounding country, and are dignified with the title of mountain—Garn, Llanelilian, and Bodafon. They are somewhat bare compared with many of the lesser eminences, though stunted ling and clumps of gorse

* Cf. 'Zoologist,' 1902, p. 401.

relieve their stony slopes. The lower mynyddau, if we may use this name, are in late spring gorgeous with gorse; this year the bloom was finer than usual, and in many places the rocky outcrops were arrayed in cloth of gold; the air was heavy with the sickly scent of the flowers, the richness of colour was indescribable. Linnets and Stonechats abound amongst the gorse, and at night the churring of innumerable Nightjars proves how well suited to the habits of this diurnally quiescent bird are these rough uncultivated tracts. Where the Stonechat is so abundant one cannot but be struck with the variation in the size of the white wing-patch of the male bird. Song-Thrushes and Blackbirds are plentiful on the rough ground, as, indeed, they are everywhere else; the Blackbird is one of the most abundant birds in Anglesea, being common alike on cliffs, mynyddau, cultivated land, and even on the bogs.

The broad flat valleys of the sluggish streams are frequently extensive tracts of bog, and though attempts have in all cases been made to drain them, they have so far defied the efforts of the reclaiming agriculturist. Between the deep straight-cut ditches, which intersect the swamps, are great beds of bog-myrtle, cotton-grass, stunted ling, and other marsh and moorland plants; in the wettest spots, buckbean, marsh cinquefoil, butterwort, and sundews grow luxuriantly, while water-lilies and yellow iris flourish in the pools. In one bog we came across fine plants of *Osmunda regalis*, and in another a large patch of the rare marsh fern, *Aspidium thelypteris*.

Meadow-Pipits, Reed-Buntings, and Snipe are characteristic birds of the bogs. The llyns, or small lakes, which occur in many places, have, as a rule, bare stony banks, where Sandpipers are to be seen; there are few streams suited to the habits of this species. The aptly named Afon Goch, which flows from Parys Mountain, were it undefiled, would be an ideal habitat for the Sandpiper; we did, indeed, see one bird upon its banks, though it is difficult to understand what it could find to feed upon in the polluted water.

The limestone cliffs between Redwharf Bay and Lligwy were, towards the end of May, wonderfully rich in colour; in places the upper slopes were sheeted with *Scilla verna*, so that the grass from a short distance seemed lost beneath a pale blue haze.

Elsewhere primroses, interspersed with the purple spikes of the early orchis, grew in profusion, their pale yellow in strong contrast with the golden glory of the gorse. The steep faces of the grey crags are the haunts of large numbers of Swifts, House-Martins, Starlings, Jackdaws, and House-Sparrows, the last two species being especially plentiful where ivy covers the rock. The Ringed Plover and Oystercatcher breed on the beaches in every little bay, several pairs inhabiting the wider stretches at Lligwy and the estuary of the Afon Goch.

On the rugged north coast—between Point Lynas and Carmel Head—the metamorphic rock is weathered into jagged cliffs and deep fissures; the outlying stacks and the great boulders and fragments of fallen cliff which lie between the tide-marks are evidence of the disintegration which has been going on for ages. There does not appear to be any breeding station of the Kittiwake, but the Herring-Gull breeds all along this coast, the largest colony being on the stupendous cliffs at Carmel Head. Amongst the Herring-Gulls on the Middle Mouse, where there is a large colony, we could see, from the cliffs of the mainland, an adult Lesser Black-backed Gull; we had noticed another two days previously on the beach at Cemllyn. We did not meet with the Great Black-backed Gull in the north of the island, but we saw a pair near Aber Menai, at the place where we noticed the bird in 1902.

Owing to contrary winds we were unable to visit the Tern colonies on the Skerries, a group of rocky islets only approachable in calm weather, but on May 23rd we found that the Common Terns had not laid on Ynys Moelfre, nor on Ynys Dulas, where in June of the previous year Mr. Cummings found them breeding in large numbers. On May 25th some seventy Common Terns were floating idly in a compact body on the calm sea off Benllech Bay; they were not fishing, and, while the majority simply rested on the water, a few individuals were splashing and washing themselves. Very different was the behaviour of some birds we saw the following day, near Point Lynas, harrying a shoal of fish. Guillemots and rolling Porpoises marked the position of the shoal, Kittiwakes flew backwards and forwards, dropping occasionally to swim on the water, while a hovering cloud of Terns hung in the air above, raining birds upon the

unfortunate fish. From our position on the cliff we could watch the impetuous headlong dive and splash of the Terns, and hear, across the water, the clamour of their harsh screams, with which were mingled the occasional loud clear call of *kitti-wa-ake* and the guttural cry of the Guillemots.

There are no suitable beaches for the Lesser Tern on the northern coast, but a few pairs frequent the shingle at Lligwy Bay, where we discovered several scratched nesting-holes, but no eggs had been laid up to the 5th of June.

A great pebble ridge—gay in early June with thrift, great white trusses of seacale, and the yellow flowers of the horned poppy—extends across Cemlyn Bay, forming on the landward side a tidal llyn or lagoon, shallow and muddy—an ideal spot for Waders. On the pebble ridge—perhaps the only possible place on the north coast—Ringed Plovers nest; when the tide is out an extensive stretch of wet mud is left exposed in the lagoon, attracting Ducks, Waders, and Gulls. On June 7th, and again on the 10th, we saw seven Turnstones feeding on the mud; amongst the tangle—and, indeed, on the brown mud—the birds were inconspicuous, but when they ran up on to the shingle they disappeared entirely, so closely did their black, white, and chestnut coloration assimilate to the variegated pebbles. When in flight one of the Turnstones uttered a sweet trilling note—the love-song, uttered in anticipation of its arrival at its northern breeding-ground. We also met with four Turnstones in Dulas Bay, and on June 12th saw five on the wrack-covered rocks in Malldraeth Bay; the majority of these birds were in full summer dress.

Black-headed Gulls, a few Oystercatchers, and about twenty Mallards—the last birds being nearly all males—were swimming or wading in the shallow water of the lagoon on June 7th. The Mallards rose on our approach; we saw them twice later during the day on the sea off Carmel Head. A couple of Whimbrels and a few black-bellied Dunlins were also feeding on the ooze. The only other Dunlins which we met with were a few at Lligwy Bay on May 23rd, and a small party on the beach at Aber Menai on June 11th. We met with no parties of Whimbrels this year, though we noticed single birds at Cemlyn or elsewhere on three other occasions. We saw Curlews on the rocks at low water in several places, but never many together.

The Oystercatcher is abundant all round the coast, nesting on the cliffs and in the bays. Near Lligwy, on May 30th, we found a nest containing four incubated eggs ; as there was only one pair of birds in the bay it is probable that all four eggs were the produce of the female, which ran silently from the nest on our approach. The nest was a slight scraping in the shingle at the foot of the primrose-carpeted cliff : it was lined with beach-worn shells of *Pecten*, *Ostrea*, and *Fusus*. Oystercatchers and Lapwings are constantly warring with the Crows which nest along the northern cliffs ; we watched one Oystercatcher make a determined assault upon a passing Crow. The Carrion tried to avoid its vociferous assailant—the Oystercatcher kept up an incessant angry shriek, *pic, pic, pic, pic*—by rising above it, but the Wader followed until both were at a considerable height above the cliffs, and eventually drove the baffled Crow off the field. A Lapwing swooped repeatedly at a young Carrion which had not long left the nest, and we witnessed the assaults of Kestrels upon these feathered Ishmaelites on more than one occasion. Near Carmel Head a pair of Crows had a brood with them just able to fly ; a male Kestrel swooped at the old birds when they passed, and, striking one, bowled it over into the grass. Here the Crow stood for a few seconds, and then cleared off. The Kestrel then hovered, stooping again and again at some object in the grass, but never actually striking the ground. When we reached the spot we discovered a young Carrion-Crow crouching in the grass, and quaking with terror.

Most of the young Carrions had left the nest by the end of the first week in June. We met with birds inland in a few places, but their great stronghold is on the northern cliffs, where we saw many empty nests, and young birds strong on the wing. On one projecting rib of black rock we found a nest containing four fully-fledged young birds, which completely filled the wool-lined hollow ; this nest was within easy reach of the top of the cliff, though other nests we saw were placed on ledges on inaccessible crags. One nest, which still contained two young birds, and from which the other two had just flown, was within a few yards of a high road which passes near the cliffs. The top of the cliff in the neighbourhood of the nests was littered with the refuse left by the maurauding Crows—freshly cleaned

limpet-shells, fragments of crabs, and in one place sucked hens' eggs.

We saw no Ravens, though Mr. Cummings has seen them in former years, and showed us a nest beneath an overhanging rock on the cliff wherein he saw three fully-fledged young in mid-April, 1902. A little further on there was another empty nest, a huge structure of thick gorse-stems, placed on an inaccessible face of the cliff.

The Kestrels on the north coast, as a rule, make use of the old nests of the Crows. When seen from the top of the cliff the red eggs are very conspicuous in the big dark nests. We found a few Kestrels nesting on the limestone cliffs in the east, but the bird was most numerous along the northern seaboard.

The Merlin is common on the northern coast, nesting among the heather near the top of the cliffs; we found three nests in one morning in June, and failed to find the nest of a fourth pair of birds. The shrill *kik, kik, kik* of a male Merlin which was flying about the heather-clad slope caused us to search for the first nest. Presently we flushed the female, and found five newly-hatched young birds in a shallow depression beneath a tuft of ling right on the very edge of the cliff. The birds were not all of the same age, and the egg-shells of the youngest lay in the nest. The eyes of the older birds were half-opened, but the younger ones were still blind. When handled the largest of the five uttered a feeble reproduction of the fierce *kik, kik* of the adults. The second nest was in a similar situation, at a spot where Mr. Cummings saw eggs last year; it contained three rather older young birds and a chipped egg. Here again the little ones, whose pink skin showed through their white down, whispered *kik, kik* when handled. The remains of a plucked Greenfinch lay near this nest, and the little greyish beaks of the birds were stained with recent blood. The third nest—a similar depression beneath a clump of ling—was within a few feet of a well-trodden footpath close to Amlwch; the clamour of the male caused us to search for and discover this nest, which contained a single egg, as it had done in the cases where there were young birds. A Blackbird, partly denuded of its feathers, lay on the cliff-top near Point Lynas, where we saw another Merlin, but failed to find the nest.

On June 9th we visited an old-established nesting-place of the Peregrine Falcon in a bay near Porth Wen, but we neither saw the birds nor any traces of their slain victims on the cliffs. Three months previously (on March 19th) Mr. Cummings saw the falcon here, and last year saw eggs in the nest at this place. A fisherman at Bull Bay, who said that the birds had nested here as long as he could remember, told us that he believed they had been shot this year by a gamekeeper. The destruction of the few surviving Peregrines is deplorable, especially in a country where sea-fowl abound and little game is preserved. It is satisfactory, however, to know that the pair on the eastern coast, which we saw in 1902, were again at the same place, and that at least one other pair nest on the northern coast. At one spot on this coast a female flew out barking furiously, followed by a male Merlin, which stooped at her several times, chasing her across the water. She paid little attention to her small assailant, and returned to the cliff, only to repeat her excursions again and again. Whenever she returned to the cliff she took up her position on a commanding piece of rock, close to a small inlet, and continued her angry barking. When we reached this spot the male left the rocks, and both birds flew out over the sea and along the cliffs, the female being the more clamorous; she never left the neighbourhood of the nest, though the male disappeared for a time. The eyrie was in a niche half-way down a precipitous cliff, and on a ledge, surrounded with grass and *Asplenium marinum*, were three young birds, pink-skinned as peaches and with their quill-feathers just showing, lying prone, apart from one another. Now and then one of them would rear itself up and shuffle awkwardly on its tarsi for a few inches. Within ten feet of the nest three pairs of Jackdaws were feeding young in crevices in the cliff, unharmed by the Peregrines, although for about a quarter of a mile beyond the nest the top of the cliff was a perfect shambles; scattered feathers littered here and there showed where the Falcons had plucked their victims. Amongst the feathers we found the remains of two Arctic Terns, a Common Tern, two domestic Pigeons, a Stock-Dove, and a Cuckoo.

We sought in vain for the Chough. The *Bran-big-goch*, as the natives call the bird, is probably extinct on the north coast, although a Bull Bay fisherman showed Mr. Cummings an old

nest in a cave near the village last year. He admitted, however, that he had not seen any of the birds in the neighbourhood for some years. The lighthousemen at Point Lynas knew nothing of the Chough, but that the bird formerly nested on Puffin Island is proved by the egg in Professor Newton's collection, which was taken there by the late Lord Lilford on May 21st, 1853. The nest contained three eggs and one young bird. Willughby does not specially mention this species in Anglesea, but says that it is found "all along the west coast of Wales." The old warrener at Penmon, whose memory carries him back to the first half of the last century, remembers the Chough breeding at Dinmor, opposite Puffin Island.

We were not fortunate enough to come across any Rock-Doves, though Mr. Newstead and Mr. Cummings have both, independently, seen white-crouped Pigeons on the north coast, and it is highly probable that a few pairs breed there. The Stock-Dove is abundant both along the coast and on the limestone terraces inland. On the great bluff of old red sandstone which rises above the southern bank of the Dulas Estuary, Stock-Doves and Jackdaws nest in hundreds. The cliff stands somewhat back from the copper-stained mud-banks of the estuary; its lower slopes and the *débris* at its foot are clothed with trees and thick undergrowth, where we heard many Chaffinches and Chiffchaffs singing. The crags above the trees, copper-red where the rock is visible, were, in May and June, clothed with ivy and great masses of crimson campion and yellow gorse; flocks of noisy Daws wheeled round the top of the cliff, and Stock-Doves and Wood-Pigeons were incessantly passing to and fro.

On May 26th we saw a Sheld-Duck on the mud of Dulas Estuary, and the previous day one on the rocks near Benllech; the bird is apparently rare on the north and north-east. While we were passing along the pebble ridge which half crosses the mouth of the Afon Goch, a Lapwing walked slowly away a few yards in front of us. At the time we were watching some Turnstones, and paid little attention to the behaviour of the Lapwing, which no doubt had young concealed amongst the refuse and scanty herbage on the top of the ridge. The bird many times jumped spasmodically, and then pitched forward on its head, waving its wings disjointedly, and struggling along the ground as

if it were badly hurt. A few minutes later we saw it lamely struggle down the ridge towards the channel of the stream, a gutter six yards wide. It entered the water and swam laboriously across, holding one wing elevated; the bird appeared to be hopelessly crippled. Reaching the far bank, it walked slowly up the mud, every few yards repeating the epileptic leaps and falls, until, some yards away on the far side of the stream, it discontinued its instinctively simulated disability, and rose on the wing.

Several pairs of Ringed Plovers nest on the pebble ridge at Dulas, and others on the beach at Lligwy, where we found fresh eggs on May 23rd, and again on June 1st. Between Lligwy and Dulas we caught a young bird in down; it crouched on the sand when we walked towards it, but ran after being handled, fed a little, and then crouched again as we approached. It uttered the *pee-ip* of the old birds, but in a much lower key. When it ran it raised its unfeathered wings, if hard pressed, as if to assist it in its flight. There were five adult Ringed Plovers on the beach near it, and two—presumably the parents of this young bird—repelled the others whenever they approached the young one, running at them with lowered heads, wings outstretched, and tails deflected and expanded. Sometimes these two followed the other birds on the wing for a considerable distance, darting after them, turning and twisting in flight. We met with two or three pairs of Ringed Plovers at Llyn Geirian, but we could not make out if the species breeds on the shores of this inland lake.

Mistle-Thrushes, fairly plentiful in the district round Red-wharf Bay and inland, are, curiously enough, abundant in the treeless country near Carmel Head. The birds sometimes breed on the cliffs; on June 7th we saw a nest within ten feet of the beach, beneath an overhanging lichen-covered rock, and Mr. Cummings pointed out another nest on the cliff-face near Bull Bay, which was occupied last year. The Blackbird, very plentiful on the gorse-covered slopes above the cliffs, also occasionally nests on the cliff itself; near Cemmaes we found one nest with fully-fledged young only a few feet above high-water mark; it was built in the grass among the rocks. We twice heard Song-Thrushes introduce the *feet-a-feet* of the Oystercatcher into their songs.

The Ring-Ouzel evidently passes the northern coast on migration; one of the lighthousemen at Point Lynas told us that this spring he had seen in his garden "a Blackbird with a broad white mark on its breast." The bird, he said, was so tame, that he was induced to attempt to catch it. No doubt many migrants touch Anglesea on their way north in spring. Mr. Cummings saw Wheatears here on the 17th and 19th of March, and probably these early birds were passing further north. On April 19th, 1902, he saw a male Redstart at Hell's Mouth, and a Whinchat near Cemmaes on the following day. He has also seen White Wagtails in spring in two or three localities—on the west coast at Rhos Neigr and Ty Croes, and on the north at Bull Bay, where on April 17th, 1902, when in company with Mr. R. Newstead, he saw a party of six or eight birds.

The Wheatear is not common on the north-east coast, but we met with a few birds between Moelfre and Lligwy, and on May 23rd saw a small party on Bodafon Mountain. We did not see any between Moelfre and Redwharf Bay on May 25th, nor on the following day between Dulas and Point Lynas; perhaps the species had suffered from the cold spring, for there were certainly not so many at Penmon as there were in 1902. Between Cemlyn and Carmel Head, however, the birds were plentiful in the first week in June, being in the greatest numbers on Carmel Head, and in the rough country behind. By the 12th of June many of the Wheatears on Newborough Warren had young on the wing.

When walking between Redwharf Bay and Moelfre on May 25th we only saw a single Rock-Pipit, but there were a few about the Moelfre rocks, and on Ynys Moelfre. North of Moelfre we met with a bird here and there along the coast, but from Point Lynas westward the species is more abundant.

We kept a sharp look-out for the Red-backed Shrike, but only met with a single pair—at Porth-y-gwichiad, near Point Lynas, on May 26th, about a mile south of the place where Mr. Cummings saw a male on June 24th, 1902 (Zool. 1902, p. 434). The birds were frequenting a short stretch of low cliff which was clothed to the beach with thorn, bramble, and gorse. They were silent, in strong contrast with the noisy behaviour of these birds when they have young. There was nothing to lead us to suppose

that they were nesting at this date, and when we visited the spot ten days later we saw no signs of the birds.

The House-Martin is not plentiful inland, but on the coast there are many colonies. The nests are affixed to the cliff-face, generally beneath a projecting or overhanging rock ; at Bull Bay the birds were building in the entrances of some small caves. We saw two colonies on the limestone cliffs to the north of Moelfre. On May 22nd, when the birds were building, we threw down fragments of cotton-wool from the cliff top ; the birds, flying to and from their nests, caught the floating bits of wool as they passed. Several House-Sparrows, which were nesting at the same spot, darted out to catch the wool, but their attempts were very clumsy compared with the dash of the Martins. On these limestone cliffs there are small colonies of Swifts ; the birds breed in crevices in the disintegrating rock. Inland, the Swift is uncommon, but we met with it in the towns of Llanerchymedd and Llangefni, and saw a few hawking for flies above the bogs.

The Swallow is everywhere abundant, but the Sand-Martin appears to be very local. Suitable nesting-places for this species are scarce, but there is a small colony in the sand above the cliffs at Benllech Bay, and a few nest in an exposed bank on the sandhills at Lligwy Bay. Inland, we found the bird nesting in the banks of the Cefni near Bodffordd, but as a rule the banks of the inland streams are unsuited to the habits of the Sand-Martin. In the north we only came across one colony, in a mud cliff near Llanrhwydrys Church.

We failed to discover any fresh locality for the Tree-Sparrow ; we again visited the colony at Penmon, but did not meet with a single bird elsewhere. The House-Sparrow is abundant ; it nests in the cliffs, in ivy, or in holes in the rock. We found the bird breeding in crevices in the bare rock on Bodafon Mountain, and saw many bulky untidy nests in thorn hedges far from the neighbourhood of houses.

The Cormorant does not appear to breed on the north coast, except perhaps on the Middle Mouse, where the Bull Bay fishermen say it sometimes nests ; these men, however, may confuse it with the Shag. On May 28th we could see eggs in some of the nests in the large colony near Bwrdd Arthur, and in one nest at least the young were hatched. We met with odd birds all

round the coast, fishing or drying their wings on the rocks. The Shag breeds near Carmel Head ; on June 7th we saw three birds brooding in cracks near the top of the cliff. We were able to add the Shag to the list of birds breeding in the more southern district ; we did not see it at all in 1902. We twice saw old birds with well-developed crests at Dinmor Point, and, besides locating the nest, found a sucked egg, left by some Gull or Crow, on the top of the cliff. An adult Gannet flew past Ynys Moelfre when we were visiting the island on May 23rd. We did not discover any new breeding stations of the Guillemot or Razorbill, though we saw a few birds fishing at sea in different places.

Inland, Northern Anglesea is under rough cultivation, mostly pasture, but large tracts of land lie waste. Gorse invades the borders of many of the fields, and covers the stony outcrops, which defy the feeble efforts of the agriculturist ; bogs and marshy meadows, most of them bearing traces of attempts at drainage in their deep straight-cut ditches, lie in the flat valleys of the streams, while here and there is a llyn or pool, sometimes almost choked with aquatic vegetation, sometimes bare as a mountain tarn. There are surely few counties where the Nightjar is so abundant as it is in Anglesea. At early dawn—on two occasions we listened to the bird a few minutes after 3 a.m.—as well as at dusk, the churring notes are heard on all sides where there is rough ground ; one bird we saw was churring from the ridge of a tree-surrounded house, and another from a chimney top.

The Lesser Redpoll is as common in the eastern wooded parts as it is in the neighbourhood of the Straits, but further north it is much less frequent. On June 4th a nest at Lligwy contained five eggs, but another nest, near Llanfechell, was unfinished on June 8th. Both these nests lacked the usual foundation of twigs, being constructed externally of dried bents and a little wool. On June 11th we saw young Redpolls on the wing.

We met with the Whinchat in a few new localities ; on May 25th we heard a male singing at Llanallgo, and two days later one in the big bog, Cors-y-Bol. On the 30th we flushed a female from some thick gorse at Lligwy, but failed to find the nest. We saw none on the north coast, but there were three pairs on the marsh where the Cefni is crossed by the Holyhead Road, the

spot where we saw the bird in 1902. The Robin and Hedge-Sparrow are plentiful inland, the former bird even breeding in wild spots far away from houses. The Common Whitethroat is everywhere abundant.

Between Redwharf Bay and Point Lynas the Blackcap is thinly distributed, but nowhere so numerous as it is along the Straits. We did not see it in the north. The distribution of the Goldcrest is similar; we found it in plantations and woods in the east, and in one or two more inland localities near Llangefni and Llanerchymedd. Leaf-Warblers are practically confined to the wooded east, and the few plantations and thickets on the borders of the streams. The only place in the north where we heard the Chiffchaff was at Llanfairynghornwy, but in the south-east it is common. The Willow-Wren, very plentiful in the wooded parts, is rare in the north; some idea of its distribution may be gathered from the fact that on June 6th, when walking from Cemmaes to Carmel Head, we only noticed four pairs. Llys Dulas and Lligwy Woods were the only places where we heard the Wood-Wren; in these favourable localities it is common.

Llanfairynghornwy, at the foot of Garn Mountain, is an oasis; fine trees grow round the ancient church and rectory, attracting many of the tree-loving birds which are absent from the bare country which surrounds the village. Here a Chiffchaff was singing on June 10th, while Chaffinches and Willow-Wrens were not uncommon. On this day we heard the notes of young Goldfinches, but it was some time before we could discover the little birds—just out of the nest—perched amongst the luxuriant foliage of the sycamores. This was not the only place where we saw the Goldfinch; indeed, the bird is not uncommon in Northern and Eastern Anglesea. At Plas Bodafon we heard and saw three or four, and there were several at Llys Dulas, as well as at City Dulas and in the Lligwy Woods. In a small clump of sycamores—trees to which this species is partial—near Pentraeth, and in another spot near the same village, at Parciau and Marianglas, we met with pairs, while on the north coast, at Cemlyn—again in sycamores—we saw a party of five.

A Blue Tit was feeding young in a hole in the wall of the old church at Llanfairynghornwy, while another hole a few feet away

was occupied by a swarm of bees. Two pairs of Spotted Flycatchers were nesting near the church. We also came across the Spotted Flycatcher in the north, in the wooded valley between Cemmaes and Rhosbeirio, the churchyard at Llanfechell, and near Llanbadrig. In the east it is plentiful.

The Blue Tit is undoubtedly the commonest Titmouse; in the east it is abundant, and it is far from rare in the north. The Great Tit, though occurring in some numbers in the east, is uncommon in the north; we found young in the nest in a wall at Cae Mawr, near Llanerchymedd, and another nest, also containing young, in a wall at Coedana on June 11th. We only met with the Coal-Tit in the east, and did not see the Marsh Tit anywhere. Even in the east the Coal-Tit is not common; we saw two at Plas Bodafon, one in Lligwy Woods, one in a gorse-patch near Lligwy, and a pair feeding young which could fly near Llanerchymedd. Mr. Cummings saw a single Long-tailed Tit in Lligwy Woods on June 6th, but we did not meet with the bird elsewhere.

The Wren is everywhere abundant. A nest of this species, built against the stem of a dead hazel-bush, was decorated with grey lichen, resembling the lichen-covered branches. On May 26th we saw a Tree-Creeper at Llys Dulas, and another in the Lligwy Woods on June 6th. Though, naturally, rare in the north, it is somewhat remarkable that this bird, so abundant on the Straits, should be scarce in the plantations in the country round Redwharf Bay.

The Pied Wagtail, though nowhere plentiful, is generally distributed; we did not find the Grey Wagtail anywhere in the north. The Cefni at Llangefni, running through a wooded valley—almost a gorge—and falling over rocks like a mountain torrent, appears suitable for the species, as well as for the Dipper, a bird we failed to find. Absent from the treeless north, the Tree Pipit is rare even in the east; we heard two singing at Plas Bodafon, and on May 26th another at Llys Dulas, which is practically the northern limit of its range in Anglesea. Lligwy Woods, the Cefni Valley near Llangefni, and Plas Gwynn, Pentraeth, were the only other places where we heard the bird.

The Greenfinch is everywhere common, and the Chaffinch

well distributed but not so plentiful; the Bullfinch is common in the east, but rare further north. Mr. Cummings saw a single pair on the coast between Llys Dulas and Point Lynas. The Yellow Bunting and Corn-Bunting occur generally, the latter being commonest near the sea.

We did not meet with the Jay, but we found the Magpie nesting near Llanerchymedd, Rhosbeirio, and at Cors Ddraenog. We saw birds at Parciau, Marianglas, Llys Dulas, City Dulas, Cemmaes, Carmel, Llanfairynghornwy, Llanfechell, and Rhos Goch. The sycamores in the vicinity of many of the larger farms are occupied by Rooks; some of the rookeries being of considerable size.

The Green Woodpecker is not uncommon in the eastern woods; we met with it at Dulas, Llanallgo, Parciau, and Pen-traeth. In Lligwy Woods we found a nesting-hole in a beech not three feet from the ground. The Cuckoo is abundant in all parts.

We heard the Barn-Owl nightly at Lligwy and Marianglas, and on May 31st we saw one on the wing at mid-day at Cors Ddraenog. In October, 1901, we saw this species at Cors Bodwrog, and Mr. Cummings has known it to nest near Cemmaes. The gamekeepers said that the Tawny Owl occurs at Parciau, Lligwy, and elsewhere in the east; and judging from the character of the country and the abundance of the bird at Penmon, this is probably the case. This species, however, is silent at the end of May and beginning of June, so that we were unable to verify the statements. We saw one bird in a Pheasant-covert at Bodffordd on June 2nd, and on the 13th, a young bird, just able to fly, in some sycamores at Llanidan, on the Straits. Our attention was directed to this bird by the commotion among the Blackbirds and Chaffinches.

The Sparrow-Hawk nests at Tyn-y-gongl; a female flew from a nest, containing six much incubated eggs, in the top of a spruce, on May 30th. In an adjoining tree was the nest of a previous year. We saw another bird in the southern district—at Llanidan—on June 13th.

Pheasants are hand-reared at Parciau, Llys Dulas, and elsewhere, but in the north there is little preservation; we saw a few birds near Llanbadrig. The country is a fairly good one for

Partridges. The Corn-Crake abounds, as it does everywhere in Anglesea.

The Moorhen is common in the bogs and round the llyns, and we saw Coots on four of the small lakes—Llyn Frogwy, Llyn Geirian, Llyn Hafodol, and the llyn near Llanfaethlu. On the first three of these waters, on Llyn Bolgolched, and on the pool in Cors Ddraenog, we either saw the Dabchick, or heard its chattering cry. A pair or two of Common Sandpipers nest on the margin of most of these llyns. On a rocky mound by a shallow llyn near Llanfflewyn, we found a nest containing two newly hatched young, with the egg-shells lying near them. The nest—little more than a scratched-out hollow—was under some gorse, and was so well concealed that we only discovered it when we flushed the female. She did not resort to the customary simulated disability to divert our attention, but joined the male, who was piping anxiously hard by, and evinced her anxiety by piping intermittently so long as we were in the vicinity of the nest.

Snipe-bogs are characteristic of inland Anglesea. Some attempts have been made to drain most of these wild marshes, and often the only paths by which one can cross them are the heaps of dried mud, taken from and bordering the ditches. Much of the bog-land is now coarse pasture, grazed by long-horned black cattle, but large tracts still defy all attempts to reclaim them. Undoubtedly the Snipe is the sporting bird of the island, for not only does it swarm in the bogs, but it is abundant in the many wet, rush-grown fields. When we crossed the bogs the “chipper-chipper” and the bleat of the drumming birds were constant sounds; Snipe were everywhere. On May 27th we found young birds just able to fly; but a few days later we came across two which had no wing-quills showing. The single old bird in charge of these young ones rose when we approached, crying *skeap, skeap*, then mounting high in the air, commenced to drum. A few moments later it came down and passed us repeatedly, flying just clear of the ground, but making no sound. The young were bright chestnut-brown, broadly striped dorsally with black bands, and the plumules of these bands were tipped with silvery white, giving the black a frosted appearance. The head, wings and thighs were trans-

versely barred with black, the under parts chestnut. The irides were dark brown, the legs and feet lead-blue; the bill, shorter than the head, was straight and broad throughout its whole length, and shaded from dark-lead to almost black. The little ones crouched, their velvety black and rich browns reminding one of the colours of the larvæ of some bombycid moths, when once we had discovered them, and made no attempt to escape after they had been handled and again placed upon the ground. We left them for some time, to allow the old bird to rejoin them; but though it alighted near, and possibly actually went to them, they had not moved when we returned to look at them again.

The bogs are the strongholds of the Meadow-Pipit in Anglesea, though the bird is generally distributed; the largest bog, Cors-y-Bol, is populated by great numbers of Meadow-Pipits, Sky-Larks, and Reed-Buntings. The last-named bird is only present in the bogs and marshes, but in many of these it abounds. On May 27th we found three nests on Cors-y-Bol, within a few feet of one another. From one of these, which contained one egg and three young birds just hatched, the male bird flew out and fluttered along the ground with trailing wings and tail expanded.

Moorhens breed on the bogs; we found them with young in the ditches. Here also Mallards were in charge of flappers, squatting along the water, while their young dived and hid in the aquatic vegetation. One duck, when her brood had disappeared, rose from the water and circled round us in short sluggish flights, only just clearing the ground as she flew. She frequently alighted, pitching heavily as if wounded, and then, with outspread wings and tail, and quacking loudly, dragged herself along the ground like a maimed bird pursued by some enemy. A duck Teal on the same bog rose from a very wet spot—a deep morass grown with buck-bean and rushes where without doubt her young were hiding—and behaved in a similar manner. In both cases the flight was noticeably sluggish. About a mile from this place we had flushed a drake Teal. Lapwings had commenced to pack by May 31st, on which date we saw a party of about a score on one of the bogs; we saw another party of about the same size a few days later. On this bog there were several Black-headed Gulls in mature plumage,

but we found no breeding colony on this or any other bog or llyn; probably these were non-breeding birds, for it is doubtful if there is a colony in the island.

One of the bogs which we visited is divided into two parts by the artificially cut channel through which the main stream flows; the lower part of the marsh was fairly dry, mainly owing to the then hot weather, and here stunted ling, coarse grass and bog-myrtle grow. Among the ling, right in the open, we found a Pheasant on her nest. On this bog, but a few feet above sea-level, at least half a dozen pairs of Curlews were nesting. All the birds were demonstrative; but one, which certainly had young somewhere in the immediate neighbourhood, flew round and over us with angry cries quite different from the usual calls of this species. When at a distance it gave the bubbling breeding cry, and several times called *courlie*. We flushed an anxious Merlin several times on this bog; and on June 4th Mr. Cummings watched a male Merlin behave in a curious manner. Starting from a grassy mound, it flew close to the ground for some twenty yards; then soaring, but to no great altitude, it hovered for a few seconds, calling *kek, kek, kek*, and returned to the same mound from which it had risen. This performance was repeated several times without variation, and when Mr. Cumming arrived at the perching spot, he flushed the hen bird from a nest which was situated in one of the dried-up hollows between the tussocks and dead bog-myrtle. The three fresh eggs were placed on a few bits of dry grass, which served for a nest lining, and were in no way covered or sheltered by the surrounding herbage.

On the eastern border of the bog the ground rises somewhat abruptly, a thicket of hazel and bramble covering the hillside, which is surmounted by an ivy-covered limestone terrace, where Stock-Doves and Kestrels nest. On the other side a narrow belt of trees—mostly firs—half encloses the wilder, higher portion of the bog, a rough waste of huge tussocks of sedge and ancient heather, dotted with birches and alders and clumps of gorse. In the tree-belt, where many Wood-Pigeons and a Magpie were nesting, we watched, on May 24th, a Lesser Whitethroat. For some time the bird sang in the plantation and then crossed the marsh, a distance of some three hundred yards, to the hazel copse on the hillside, where we heard it

singing frequently, but failed to find a nest. The bird sang with vigour in the sultry weather, keeping close to one particular spot. On three different days we both saw and heard it, but we could not rouse a female from the dense jungle of brambles and hazel.

On May 25th we saw a Garden-Warbler in the belt of trees. The bird was silent. This was the only one we saw in the north or north-east. A pair of Garden-Warblers were nesting in a bramble near Plas Newydd Park-gate, at the spot where we heard the bird in 1902; we found four fresh eggs in the nest on June 13th.

Two Grasshopper-Warblers were in full song on the bog in the broiling heat at mid-day on May 24th, and on the following day we put up two pairs, and heard a third bird singing in another part of the bog. The Grasshopper-Warbler abounds in North-east Anglesea, in bogs as well as on the mynyddau, but is less common in the north. We frequently heard the bird, both in the daytime and in the evening, near Redwharf Bay, Cemmaes, Marianglas, Llanerchymedd, and other places. One near Lligwy Bay was reeling in a willow-bush about 9 p.m.; it stopped when we approached, but when the bush was struck with a walking-stick burst into ear-piercing song, singing again and again while we stood but four feet away.

While we were struggling through the old growth of ling and gorse on the higher portion of the bog, stepping from one great clump of sedge to another, or wading in the water which filled the hollows between them, a Short-eared Owl rose a few yards in front of us, and mounting high into the air, sailed above our heads for more than an hour. It had little of the flapping, reeling flight of other Owls, but sailed on its long narrow rounded wings for minutes together without a wing-beat. The strong sunlight passing through the primaries and secondaries gave the appearance of a broad light fringe to the mantle. While it swung across the moor, high above our heads, its rounded wings and long tail made it appear more like some huge shark-moth outlined against the sky than a bird. It watched us constantly, both while we beat the moor, searching for its nest, and when we lay on the ling to observe its actions; it moved its round-faced head from side to side, and frequently uttered a fierce barking cry—*whowk, whowk*. Passing birds noticed it and

flew screaming to mob it; a male Merlin stooped at it several times, a Curlew and a Black-headed Gull attacked it; but it paid little attention to its assailants, save that it occasionally clapped its wings sharply together. As the Owl drifted to and fro, it went, at intervals, through a curious performance, the significance of which is not clear. It smote its wings together sharply two or three times, making them meet, not only above its back as a Nightjar does, but bringing them together beneath its belly, and at the same time shaking its whole body from side to side. This demonstration, accompanied as it was by a noise like the loud clapping of hands, was probably intended to terrify us and the birds which assaulted it from time to time. Whatever its function may have been, it was repeated several times on this day and when we visited the moor on subsequent occasions. Sometimes the bird perched for a few seconds in one or other of the small alders, or on the ground; but most of the time we were on the moor it remained in the air above us, never travelling far away. Neither when on the wing, nor when the bird was perching, were its ear-tufts visible. Scattered pellets lay about the moss, and here and there on the top of the furze-bushes were the feathers and remains of small birds, but some of these may have been the *débris* left by Merlins. In one spot we found a fragment of egg-shell, but we failed to find the young, or to put up a second old bird. On the following day, and again a few days later, we visited the place, putting the bird up from about the same spot; on each occasion it behaved as on our former visit. On June 4th Mr. Cummings was at the moss alone, and fortunately found a fledged young bird crouching in the ling. When he took it up the little bird made no resistance, but kept its eyes upon him. When he replaced it on the ground, however, and touched it again, it snapped and hissed, assuming a terrifying attitude by puffing out its feathers and arching its wings above its back, after the manner of young Long-eared Owls. It also made several fierce attempts to fly at his face when he was bending over it. Meanwhile the old bird became terribly excited, swooping down close to his head, and uttering a wilder and more angry note than the barking *whowk*, which sounded like *quack, quack, quack*. It pitched on the ground near him, assuming the terrifying attitude which is common to many of the Owls, and rolling its head from side to

side. As he left the moor the old bird followed, swooping close to his head repeatedly; indeed, he several times expected to be struck. So ferocious and persistent were these attacks, when Mr. Cummings had the young bird in his hand, that he was glad to take shelter under a tree. The adult Owl did not strike its wings together on this occasion in the way it had done on previous days.

The plumage of the young Short-eared Owl is similar in many respects to that of the adult, but is somewhat darker; the beak is lead-coloured, and surrounded by white bristles, and there is a pronounced crescent-shaped white rim above the eye, near the top of the facial disc. The bird was almost ready to fly, and the eggs must therefore have been laid early in April. The pellets we picked up were composed chiefly of Field-Voles and Common Shrews, but there were also remains of one Water-Shrew, one young Brown Rat, a few Wood-Mice, and a small Warbler.

We paid a flying visit to Penmon and Puffin Island. The Shag at Dinmor was the only noteworthy addition to the list of birds which we noted in 1902. On May 29th there was not a single Puffin on the island, though there were many swimming in the sea with Guillemots. Mr. O. V. Aplin's experience was similar on May 21st and 22nd; the birds were undoubtedly late in coming to land in this cold and backward spring.

On May 28th a Green Woodpecker flew from an old nesting-hole about four feet above the ground, in a roadside oak at Penmon. The old cavity had been deepened, and much litter of rotten wood lay at the foot of the tree. Four or five stones, perhaps dropped in by passing boys, were embedded in the chips at the bottom of the hole, and on these stones was a single fresh egg. Another hole, in an elder in the park, was but three feet from the ground.

When Mr. Aplin visited Penmon on May 21st, he saw a Purple Sandpiper, feeding with customary tameness on the rocks below the lighthouse buildings; he noticed a Corn-Crake on Puffin Island, and we saw the Common Whitethroat, Linnet, and Robin there, birds which we did not see in 1902.

We spent a few days at Newborough, visiting Malldraeth Marsh and the Warren. Among the many Sheld-Ducks, feeding on the sands fringing Malldraeth Marsh, on June 12th, were a

pair of old birds with two young in down only a few days old. When the old birds caught sight of us they ran for a few yards and then rose; the young ones scuttled away at a great pace towards the river, which at low water was perhaps half a mile away across the sands. It was only after a smart chase across the wet sand that we managed to come up with one of the young birds. When hard pressed the little creature elevated its downy wings to assist it in flight; it doubled and turned this way and that with such rapidity that we had the greatest difficulty in securing it. As it ran across the sand in the sun's eye, it was almost invisible from a little distance, and we lost sight of the other altogether. The old birds meanwhile flew round us with guttural cries of alarm, but they made no attempt to lure us away by feigning injury. Six young Sheld-Ducks in down, rather older than these two, were swimming on the lagoon behind the embankment at Malldraeth Yard. A passing man sent his dog into the water to catch them, and for a quarter of an hour the dog swam gamely after the little birds. The party scattered as soon as the dog approached, and whenever one of the ducklings was in danger of being caught, it would dive and come up again a few feet away. The dog then turned its attention to the nearest duckling which was swimming, and failed to capture it in just the same way. The birds kept to the open water, and never swam into the weeds or shallows; and after a time the dog began to show signs of fatigue. When its master called it out it was exhausted, but the ducklings were apparently quite fresh. When we passed the place a little later the old ones were swimming with their brood; neither of them had come near while the dog was chasing the little ones. We had no means of ascertaining if the old birds purposely kept away; possibly they did, their instinct teaching them that when the young are on the water, where they are so well able to take care of themselves, no serious danger can menace them. In this case the little birds were never in any real danger.

On May 24th we saw two drake Shovelers on the llyns by the old coal-workings on the marsh near Gaerwen, where we had seen the species before. Herons are abundant in this district, in contrast with the northern part of the island, where we saw very few. On June 12th eleven birds, old and young, were standing with many Black-headed Gulls in a tidal creek by the

roadside at Malldraeth Yard ; they were resting, but every now and then one would plunge its beak into the stream and capture a small eel or other fish. We found Oystercatchers nesting on the beach by the sandhills in several places on the Warren ; two of these nests, on sand, had no lining, but a third, on shingle, was lined with fragments of beach-worn shells. When a brooding Oystercatcher sights a man from a distance it always leaves the nest silently, running for some distance before rising, if it takes wing at all. On June 12th we found a nest in a hollow on the Warren, perhaps a quarter of a mile from the sea ; the bird ran from the nest and disappeared amongst the sandhills. The nest was a clean cut hollow in the turf, seven inches in diameter, and two inches deep in the centre, lined with a few dead twigs of dwarf willow, and many dead shells of a small land snail, *Helix caperata*. On the same day we saw a hen Kestrel, heavily burdened, fly slowly across the Warren, and alight on a rock. When we reached the spot the bird rose and let fall a young Starling, which was fully feathered, and had been on the wing for some time ; a bird of this size is rarely taken by the Kestrel. We were shown two clutches of Merlins' eggs which had been taken on the sandhills this spring.

The colony of Common Terns on Ynys-yr-adar is a large one, and when we visited the stack on June 12th the birds rose and flew above us in a screaming white cloud. Old plants of *Lavatera arborea* and *Beta maritima* grow in the cracks in the jagged rocks, the woody stems of the beet being often as thick as one's wrist. Some of the nests were built of dead stems, and the eggs placed amongst the herbage, but other eggs were placed on the bare rock without any attempt at a nest. In June, 1901, Mr. Cummings saw a Black Guillemot in full breeding plumage on this stack ; the bird, it seems, had been noticed by the pilot for about three weeks previously, but he could not identify it with any bird he knew. It was solitary and very shy.

On June 11th a party of at least twenty-three Sanderlings in breeding plumage were feeding on the beach in Llanddwyn Bay. When crossing the beach next day we picked up one which had been shot ; it was in full summer dress. Three Common Scoters were swimming close inshore in this bay on the evening of the 11th, and on the 12th we saw a pair of Great Crested Grebes in full breeding plumage on the sea in Malldraeth Bay.

NOTES AND QUERIES.

MAMMALIA.

Gestation of Badgers.—The article in 'The Zoologist' for December, 1908, on this interesting subject made me refer to sundry notes in my possession. Some years ago I made inquiries of Mr. J. Paterson, Rutherford, near Kelso, who has kept Badgers for many years, and who has bred these interesting animals in confinement, and reared their young. He had no doubt as to the period of gestation, viz. eight months. Mr. Paterson attends to his Badgers himself, and so his statement is the result of personal observation, and not information received second hand, nor the theories of others. He has seen the act of copulation, and the young were produced in due course eight months after. He has found his female Badgers come in season but once a year, towards the end of June or beginning of July, the young being born towards the end of February or March following. The rutting season of the female seems to come on each year almost to a day, and the young are similarly born almost to a day eight months after copulation. One young female Badger had her cubs on her own birthday. Two female Badgers, housed together, have been known by Mr. Paterson to suckle indiscriminately the cubs of each other in the most amicable manner. I trust that the above information, which may be relied on as accurate, may be of interest to readers of 'The Zoologist.'—CHARLES COOK (11, Belgrave Crescent, Edinburgh).

The Lesser Shrew in Yorkshire.—When out for a walk on Dec. 6th, 1908, my daughter picked up a dead example of the Lesser Shrew (*Sorex pygmaeus*) in Long Lane, Ackworth, in the West Riding. Within a few inches of it was laid a dead Mouse, which, from the description, I think was a Short-tailed Field-Vole (*Arvicola agrestis*). Although the Lesser Shrew has been reported from widely separated localities in Yorkshire, it has not been frequently identified in the county; but it is not at all improbable that it may often have been overlooked and not distinguished from the Common Shrew (*Sorex araneus*). Dr. P. Chalmers Mitchell kindly identified the specimen. — WALTER B. ARUNDEL (High Ackworth, Pontefract).

AVES.

British Examples of the White-spotted Bluethroat (*Cyanecula wolfi*).—In confirmation of my remarks on the first recorded British occurrence of this species, at Scarborough, in the year 1876 (Zool. 1908, p. 23), may I be allowed, in anticipation of the forthcoming 'Birds of Yorkshire,' to quote from a letter by the late Alfred Roberts, who stuffed the bird in question, written to Mr. W. Eagle Clarke, which runs as follows :—

"Scarborough, 1st January, 1880. A fine female specimen of the Blue-throated Warbler was found dead under the telegraph wires, near Scarborough, by the late John Young, gamekeeper to Lord Londesborough, . . . *It had a white satiny spot in the centre of the blue throat.** The specimen is in the possession of Mrs. Young."

This letter may perhaps serve as an answer to Mr. Nicoll's comments (Zool. 1908, p. 481), which cast a doubt on the authenticity of the above record.—T. H. NELSON (The Cliffe, Redcar).

Great Grey Shrike (*Lanius excubitor*) in Cheshire.—On Dec. 25th, when riding along a lane at Redesmere, Capesthorpe, I saw a strange bird with long rounded tail and undulating flight settle on the topmost twig of an oak some little distance away, from which it flew to a similar position on another tree before I could approach sufficiently near to see it clearly. In this second position I was able to obtain a better although not a good view of it before it again moved to another tree-top some few hundred yards away. I then was able to see it was a Great Grey Shrike in dull plumage, probably of the immature bird. When it flew I could just see that it appeared to have the double white wing-bar. A Starling, evidently with a disposition to mob it, flew into the same tree, and its presence seemed to irritate the Shrike somewhat, as it assumed a threatening attitude. I was able then to form a fair comparison as to the size of the two birds.—FRANK S. GRAVES (Ballamoar, Alderley Edge).

Waxwings in North of Ireland.—In 'The Zoologist,' 1908, p. 456, Mr. W. C. Wright states there are only two records of the Waxwing (*Ampelis garrulus*) for the North of Ireland during the past forty years. This is not correct, and might mislead students of Irish ornithology in the future. In addition to the two occurrences quoted, the following are on record :—1881, one, Donegal; 1898, three, Antrim; two, Londonderry; 1895, one, Armagh; 1901, one, Down.—ROBERT PATTERSON (Holywood, Co. Down).

* The italics are mine.—T. H. N.

Late Appearance of House-Martins at Eastbourne.—I think it may be said that the House-Martin is generally to be seen at Eastbourne during the third week in November, but seldom so late as the 26th. The latest ever seen by me were two at Beachy Head, Dec. 1st, 1888, and another was seen there by my brother on the 9th of that month.—ROBERT MORRIS ("Fernhurst," Uckfield).

"Xanthochroism" in the Greenfinch (*Ligurinus chloris*).—I have just seen, at Mr. Nash's, the birdstuffer, in Lincoln, a curious variety of the Greenfinch. The colour of the bird is chiefly of a pale canary-yellow, brighter on the upper tail-coverts and paler on the head and under parts. The four right rectrices and some of the primaries and secondaries appear of the normal colour, while others are white or pale yellow. The primaries show the conspicuous yellow outer webs, so the bird was probably of the male sex. The bird presents a curious washed-out appearance, and there is no trace of olive-green in the plumage. I was told that it had been obtained about Dec. 12th, 1903, a few miles from the city of Lincoln. I am unaware whether this species is much subject to variation; perhaps this specimen resembled the one recorded in 'The Zoologist' for 1885, p. 110. Mr. Nash also received about the same time a Yellow Bunting, which, were it not for the shape of its bill and a few darker feathers in the plumage, might easily be mistaken for a cage Canary. — F. L. BLATHWAYT (5, Monks Leys Terrace, Lincoln).

Snow-Geese (*Chen hyperboreus*) in Co. Mayo.—Having been informed by Mr. Williams of the capture of the pair of Snow-Geese in Co. Longford (Zool. 1903, p. 459), I asked my friend Mr. J. Knox, of Belgarriff, Foxford, to look out for any white Wild Geese with black-tipped wings visiting the Wild Goose haunts of this neighbourhood; and, strange to say, on Dec. 1st, when walking in his avenue on that day, four Snow-Geese passed over his head (quite within shot) on their way to that great Wild Goose haunt of North Mayo—the wide expanse of Foxford meadows on the banks of the River Moy. There was no mistake in identification, for the black-tipped wings showed out strongly against the white plumage. One day about the middle of November last, Capt. Kirkwood, of Bartragh, had his attention called by his daughter to a flock of eight birds flying over the island from the bay. They appeared perfectly white; but, owing to the distance, he did not notice any black on the wings; but what chiefly attracted his attention was their small size—not half as large as Swans, which he at first thought them to be.—ROBERT WARREN (Moyview, Ballina).

Ferruginous Duck in Yorkshire.—In the spring of last year four examples of the Ferruginous or White-eyed Duck (*Fuligula nyroca*) put in an appearance on a reedy sheet of water within a short distance of the village of Ackworth, in the West Riding. One of them—an adult male—was shot, and at the same time two others were more or less incapacitated, while a few days after an adult female was secured, but I do not know whether it was one of those which had been injured. I saw the male the same day that it was procured, and I examined the female immediately after it was shot. As the soft parts of several preserved specimens of this species which I have recently seen in public institutions are not correct in colour, I may state that the bill of each of the birds obtained was dark blue, with a black nail; the legs, toes, and webs were lead-colour, the webs being darker than the other parts; the irides of the male were milk-white, and those of the female were slaty brown—slate-colour, shot or shaded with brown from the outer edge. Some authorities, somewhat vaguely, describe the irides of the female Ferruginous Duck as being not so white as, or less conspicuously white than, those of the male. The other two Ducks, which are male and female, remained and still continue on the piece of water. The male is frequently seen on the water, and sometimes on the wing. The female is of a more retiring disposition. Both Ducks are, however, strong on the wing, and have been for some time. The male has been seen within the last two or three days. On the same water, in the spring of 1901, a male Tufted Duck (*Fuligula cristata*), that was paired, was shot in the wing, incapacitating it for flight for a time, and it and its mate remained and nested, and brought off a brood of seven. There is no evidence that the Ferruginous Duck nested. — WALTER B. ARUNDEL (High Ackworth, Pontefract).

Great Skua (*Stercorarius catarrhactes*) in the Isle of Man.—Early in December, 1908, I saw, in the hands of Mr. Adams, taxidermist, of Douglas, a specimen of this species. It had been during the late autumn or early winter taken at Douglas on a baited hook, and had been kept a short time alive. Scarce in the Irish Sea, this Skua is included by Mr. Kermode in his Manx list (1901), with the note, "Off the south of the island in autumn." This is the first instance of its being obtained here which has come under my notice.—P. RALPH (The Parade, Castletown, Isle of Man).

Pomatorhine Skuas (*Stercorarius pomatorhinus*) in Suffolk.—On Dec. 8rd last I received two fresh killed young birds of this species from Lowestoft, and on the 19th another was shot in Thorpe Mere,

Zool. 4th ser. vol. VIII., January, 1904.

near Aldeburgh, which the Rev. H. A. Harris was good enough to send me in the flesh. One or two local specimens have also been lately received by Mr. Hudson, the Ipswich birdstuffer. Mr. Patterson, in his list of the "Birds of Yarmouth" (Zool. 1901, p. 296), says that "this species is the most frequent of the Skuas on the east coast of Norfolk," but in Suffolk it is a decidedly rare bird, and I have no records of its occurrence during the last ten years.—JULIAN G. TUOK (Tostock Rectory, Bury St. Edmunds).

Birds of Oxfordshire or Buckinghamshire?—It is not my purpose to offer any criticisms on the ornithology of Mr. O. V. Aplin's interesting "Notes on Oxfordshire Ornithology" (Zool. 1903, pp. 444 *et seq.*), but simply to stand up for the rights of my own county, Buckinghamshire, for which I claim a share of the occurrences credited to Mr. Aplin's county. "The Ornithology of Henley-on-Thames" certainly sounds as if it referred to Oxfordshire, but the river is the boundary of the the county, so that Berkshire is within the proverbial stone's throw of the town, and Buckinghamshire reaches within three-quarters of a mile of it; so that any notes concerning the district surrounding Henley must refer almost equally to these three counties, and I trust therefore that Mr. Aplin will pardon my thus championing Bucks.

WHITE-TAILED EAGLE (p. 445).—By far the larger part of Fawley Court Park is in Bucks, so that unless the particular fir-plantation was specified as in Oxon, the former county should be credited with the specimen.

MERLIN.—Skirmett (whence I write) is not "on the hills in Bucks," but the hamlet lies in a valley running nearly due south to the Thames about four miles off. It is practically surrounded by hills, especially on the north, east, and west. I wonder if the nest of this species reported in 1864 was on what is now my land! I may point out that Wooburn (always spelt with double o), mentioned in the footnote to this species, is in Bucks, though its neighbour Cookham is in Berks.

Stonor Park (p. 446) is fairly claimed as Oxfordshire, but the house is not more than $2\frac{1}{2}$ miles, "as the crow flies," from whence I write, and much of the estate, *i. e.* of "the shooting" adjoining this, is in Bucks; so if the Goshawk were not obtained actually in the Park, it may well have been a Bucks specimen.

BUZZARD.—I may venture to state that on May 18th, 1900, I saw a Buzzard on the wing near the new National School, Hambleden. I only saw it through the (open) window of a close-fly, but am satisfied I did not mistake a Kestrel for this species! I subsequently learnt

that a Buzzard was killed at Datchet (Bucks) in the following month, which emboldens me to "have the courage of my convictions"!

GOLDEN ORIOLE (p. 447).—Turville Park is in Bucks (as well as Ibstone and North End), but on the Oxon border, so "about the borders" might apply to the latter county. Reported to have nested near North End in 1902, but whether in Bucks or outside the limits of Turville parish, in Oxon, I do not know. The nest was taken.

GIRL-BUNTING and **HAWFINCH** (p. 448).—Part of Henley Park is in Bucks.

Medmenham (p. 449) is in Bucks (not Berks). It is correctly assigned on p. 458.

ROCK-DOVE.—Used to breed on the chalk escarpment near the river edge, between Danesfield and Harleyford (between Medmenham and Great Marlow), Bucks. Unfortunately I neglected to secure any specimens before shooting on the river was stopped, and do not know whether they still occur there. On one occasion many years ago I flushed a specimen from a small gravel-pit in a wood near Little Marlow.

QUAIL.—One shot while Partridge-shooting on my land here, Sept. 20th, 1902, and I was told that some had been heard calling here in the spring of 1900.

STONE CURLEW (p. 450).—Fly constantly backwards and forwards past this house every evening during four or four and a half months in the summer, and, I believe, breed in a neighbouring plantation, on the side of a Chiltern.

HERON.—There is a flourishing heronry now at Oaken Grove, Bucks, near Greenlands, where birds and nests are carefully preserved by Mr. W. D. Mackenzie, of Fawley Court. The Harleyford (Bucks, Great Marlow parish) heronry has of late years been much disturbed by the cutting down of trees and shooting, and I fear there are very few nests there now.

PURPLE HERON.—"Near Reading." As Reading is in Berks, the specimen, in the absence of more precise locality, must reckon as belonging to that county, though the opposite bank of the river is Oxfordshire.

NIGHT HERON.—"In the neighbourhood of Oxford." The converse of the last sentence applies to this.

CORN-CRAKE (p. 451).—So far as my experience goes, this species has only become scarce since 1899, and from the same year the Turtle-Dove has become extraordinarily numerous.

RED-NECKED GREBE (p. 453).—Greenlands, Hambleden parish, is in

Bucks (not Berks). It is on the river-bank just above Hambleden Lock.

CORMORANT.—I saw either a Cormorant or Shag on the river off Great Marlow a good many years ago, but could not see which species it was, as it was in a very thick fog. Magpie Eyot is, I believe, reckoned as Bucks (as well as Medmenham and Marlow), but if not, it would be Berks, and several miles from Oxfordshire.—A. H. COCKS (Poynetts, Skirmett, near Henley-on-Thames).

PISCES.

Porbeagle Shark in Killala Bay.—On Nov. 20th, 1903, when walking along the Enniscrone Sands, I found two of these fish thrown up by the surf; they were both females. The largest specimen measured 8 ft. 1 in. from tip of snout to end of longest lobe of tail, and the second about 6 in. less. On inquiry, I learned that these specimens and three others were entangled in the Herring-nets a few nights previously, and killed by the fishermen.—ROBERT WARREN (Moyview, Ballina).

NOTICES OF NEW BOOKS.

Catalogue of the Noctuidæ in the Collection of the British Museum.

By Sir GEORGE F. HAMPSON, Bart. Published by the Trustees of the British Museum.

THIS is the fourth volume of the "Catalogue of the Lepidoptera Phalanx"; it is devoted to the *Noctuidæ*, so far as the *Agrotinæ* extend, and amply describes and deals with some 1200 species. As the whole *Noctuidæ* is estimated to contain some ten to twelve thousand described species, the magnitude of the proposed work may be appraised by the size of this large and dominant family alone.

To bring such a large and difficult family into a consistent whole, and with monographic revision, is a task that will be greatly valued by all lepidopterists. Those workers who have been compelled to deal with the *Noctuidæ*, when enumerating some lepidopteral fauna, will scarcely need to be reminded of the classificatory chaos that has hitherto existed, not only with species and genera, but even as regards families; for Sir George is now including in the *Noctuidæ* many genera which perhaps, owing to their bright coloration, have been arranged erroneously in other families. Then again, with these obscure moths, the unfortunate entomologist who has been compelled to describe species by the exigencies of faunistic publication, has frequently had to run appalling risks of redescription, and the details of the synonymy in this volume will show how many have fallen into the synonymic pit. From the vast material contained in the British Museum, and the willing help afforded by lepidopterists in all parts of the world, the author has been enabled to compare and digest his material; so that we may now run few risks of confusion, be able to have an adequate grasp of the *Noctuidæ* as a whole, and can tabulate reliable facts in the study of the geographical distribution of insects.

It is only from those who have engaged in monographic work that Sir G. Hampson can hope for real sympathetic appreciation, while it is also from the same quarter that criticism must be expected. Human nature being as it is, we do not rejoice at seeing our specific creations relegated to the synonymic basket; some may regret that their classificatory proposals have not been followed, others that their species are regarded as varieties, their varieties estimated as species, their new genera as unnecessary foundations, or the genera they have used as mistaken ones; and yet this is the very work that a revisionist must undertake. Again, the monographer, strange to say, is always still the pioneer, for no classification is final, no revision the last word; it is the excellence of one monograph that makes a better one possible, and this is no paradox, but is an acknowledgment which is often absent, or none too kindly made in a subsequent work. By the aid of a good descriptive catalogue like this volume, it become possible for any capable entomologist to make an exhaustive study of some small and special group, when, if an error can be discovered, however small, or a misconception sustained, the fact is usually accentuated with much satisfaction by an early application of the printing machine. Such is the fate of the monographic revisionist! He is never spoiled by universal flattery. He is supposed to correct any error, and expected to never make one himself. Seldom is the dictum of Horace applied, that the best man is one that hath fewest faults.

This volume is a standard one, and in the best sense advances the study of Lepidoptera.

Evolution and Adaptation. By THOMAS HUNT MORGAN, Ph.D.
The Macmillan Company, Ltd.

THIS book is another contribution to the opinion that natural selection is not the dominant factor in evolution as held by so many biologists. For an American treatise, it is noteworthy by its very qualified Lamarckian adhesion. On the question of the inheritance of acquired characters, Dr. Morgan's verdict is "not proven," with the rider that he is "not sure that we should not be justified at present in claiming that the theory is unnecessary, and even improbable." The mutation theory of

De Vries finds most favour with the author, who concludes that "a species does not arise from another one because it is better adapted"; but that "the formation of the new species is, as a rule, quite independent of its adaptive value in regard to the parent species"; while after "it has appeared, its survival will depend upon whether it can find a place in nature where it can exist and leave descendants." This view is quite distinct from the theory of Darwin, and is called the "*survival of species*." The final paragraph will tend to further elucidate Dr. Morgan's meaning: "If we suppose that new mutations and 'definitely' inherited variations suddenly appear, some of which will find an environment to which they are more or less fitted, we can see how evolution may have gone on without assuming new species have been formed through a process of competition. Nature's supreme test is survival. She makes new forms to bring them to this test through mutation, and does not remodel old forms through a process of individual selection."

Quite apart from the enunciation of any particular view on these debated questions, the volume is a particularly good and accurate guide to the teachings of a large number of natural philosophers, including Darwin, Weismann, Lamarck, Mendel, De Vries, and Nägeli, with references to others who are now less read, and apparently even less remembered. We think on this point that the author would have added to the value of a really good book by referential footnotes, or an appended bibliography.

This Darwinian literature—the inception of which is all due to the great master, and must bear his name—is now capable of forming a library by itself. Like the historic verger who said that he had heard the Hulsean Lectures for thirty years, and yet thanked God that he was still a Christian, we turn from the perusal of these many books, from the rival doctrines of neo-Darwinians and neo-Lamarckians, and feel profoundly satisfied that we are still among the evolutionists.

EDITORIAL GLEANINGS.

THE following extract is from our weekly contemporary, 'The African World':—

"It appears from the last report on the Uganda Protectorate that the game regulations, which have now been in force for the last three years, have worked well, and no instance has been brought to notice during the year of any breach of the rules by sportsmen. In the tracts immediately under control the provisions of the regulations have been fairly well kept by the natives, but in the more distant parts this has not always been the case. The most direct result of the regulations has been to afford partial immunity to the large herds of Elephants in the Western Province, which are now consequently said to be on the increase. These herds roam at different seasons of the year along the western shore of Lake Albert, between Unyoro, Toro, and Ankol, and these districts, with the Nile Province, afford perhaps the best field in this part of Africa to the sportsman anxious to secure a large pair of tusks. But, whilst preserving the Elephant, it is necessary also to think of the people. Latterly, and as a practical result of protection, many complaints have been received of damage done to shambas and cultivation by Elephants, plantations being destroyed, and, in several instances, habitations and villages being deserted. The matter has been taken up, and temporary arrangements have been made by allowing, under certain well-defined conditions, Elephants actually found doing damage to plantations being killed, whereby it is hoped cultivation will be preserved with the least loss to the herds. At the same time, a few licences will be issued to the chiefs, allowing them to shoot two Elephants each under the game regulations on payment of the prescribed fee.

"As regards game generally, it finds a natural protection in the long grass, which obscures it from view for the greater part of the year in many portions of the Protectorate. Except when the grass is burnt, it is quite possible to march for many days and see little or no game, though it is well known to be in the neighbourhood."

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THE ZOOLOGIST

No. 752.—*February, 1904.*

THE STORY OF A PEARL.

By Prof. McINTOSH, M.D., LL.D., F.R.S., &c., Gatty Marine
Laboratory, St. Andrew's University.

(PLATE I.)

Few subjects in natural history have had so much attention devoted to them both by the popular, and, it may be, poetic writer, and by men of science, as the subject of this paper. Used as pearls were from very early times, and therefore by uncivilized races, as ornaments, their innate beauty and peculiar fitness for decoration made them popular. Thus they were utilized by the Hebrews, the Egyptians, the Ethiopians, the Medes, the Persians, the Greeks, and the Romans; whilst their precious nature was described by the Chinese nearly 2000 years before Christ. Even the forgotten races of the Mississippi valley diligently collected and employed the fresh-water pearls of that region in a remarkable way, for in some of the mounds they are found not by hundreds and thousands, but by bushels, and in some cases are studded thickly on the garments enveloping their dead.*

The earlier writers, such as Pliny and Dioscorides, attributed a fanciful origin to pearls, viz. that they arose from drops of

* G. F. Kunz, 'Brief History of Gathering Freshwater Pearls in the United States.' *Bullet. U.S. Fish. Com.* vol. xvii. pp. 321-380, 1898.

dew, or, as others more poetically termed them, "tears of the Nereids." Columbus, therefore, on discovering the coast of Paria,* thought he had fallen on the right place for pearls, as the trees grew with their roots in the sea, and these roots were covered with Oysters ready to receive dewdrops from the leaves above them. Ælian, on the other hand, thought they were formed by a flash of lightning in the open shells. Even now there are differences of opinion as to their origin, some (after Rondelet) considering they arise from a diseased condition of the shell-fish, such, for instance, as produces gall-stones or other morbid deposits; others, after Réaumur (and Profs. H. Merkel,† Möbius, and Grand,‡ who followed him), to an abnormal concretion, or an abundant secretion of the nacreous material; to the entrance of a grain of sand (Stenone, Redi, and Count de Bournon, followed by De Blainville§); or calcareous crystals, organic *débris*, and amorphous bodies between the shell and the mantle; to the irritation caused by a parasite (De Filippi, *Distoma duplicatum*, and other forms in fresh-water pearls; Küchenmeister, water-mite—De Filippi comparing them with galls); by an egg of the Mussel itself (Sir E. Home||), or that of a parasite. Küchenmeister found cysts enclosing larvæ of *Atax* (a mite) in *M. margaritana*; Möbius, remains of Trematodes in pearls from the same species; Kelaart¶ showed the importance of parasites in such formations in *M. vulgaris*, a view confirmed by Thurston; and Garner** observed that the pearls in the Common Mussel were due to Distomids. The same opinion was advanced by Comba, Giard, and quite recently (1901) by Dubois. The view that they are allied to sedimentary concretions, again, was brought forward by Dr. George Harley,†† who thought them similar in structure to mineral nodules of wavel-

* P. L. Simmonds, 'Commercial Products of the Sea.' London, 1879, p. 421. Much interesting information will be found in this work.

† "Mikrogeologie" in 'Froriep's Notizen,' 1857, i. Bd. no. 2, p. 18.

‡ "Méthode de cult. de l'Huitre Perlière," 'Rev. Marit. et Colon. Ann.' 1895.

§ 'Dict. Sc. Nat.' vol. xxviii. p. 505.

|| 'Philos. Trans.' 1826.

¶ 'Ann. Nat. Hist.' third ser. i. p. 81.

** 'Proc. Linn. Soc., Zool.,' xi. p. 426, 1871.

†† 'Proceed. R. S.' xlv. p. 618.

lite and to balls of iron pyrites, as well as to gall-stones and calculi of carbonate of lime. Dr. Lyster Jameson* has recently revived the opinion of De Filippi,† viz. that they are caused by parasites.

Linnaeus, Chemnitz, and Olivi knew that pearls of a kind could be produced by perforating the valves of the Pearl-Mussels. The former, indeed, thus thought he could produce pearls at will, and, it is said, offered to publish his secret for the benefit of the State. Bouchon-Brandely, who specially studied the French shell-beds in the Tuamotu group of isles, likewise bored the large Pearl-Oysters (Pintadines), fixing the rounded piece introduced as a nucleus by a wooden pin. It was covered by a nacreous layer in four weeks.‡

Pearls are found in many shell-fishes, not only in bivalves, where they are best known, but in univalves. Amongst bivalves, they have been found in the Common Oyster (*Poli* procured a pearl near the heart), *Pinna nobilis*§ (brown, black, or red pearls), *Spondylus gæderopus* (greenish and pale rose-coloured pearls), *Anomia cepa* (purple pearl), and *Placuna placenta* (the Tangle-gam Pearl-Oyster, also called Chinese glass or window Oyster, the shell of which is valuable). Audouin, in 1828, found a minute one of a fine white colour, but not iridescent, in Solen.

Amongst univalves, pearls occur in *Strombus* ('Conch,' of the West Indies), and of a pretty pink colour; *Turbinella* (chank-shell), pale red pearls; two species of *Turbo*; in *Haliotis*, and others.

The majority of the valuable marine pearls are procured from the various species of *Margaritifera* (Pearl-Oyster), and especially from the Ceylonese Pearl-Oyster (*M. vulgaris*), a species extensively distributed off Ceylon, Southern India, the Maldive Islands, in the Persian Gulf, the Red Sea, Malay Peninsula and Archipelago, Australia, New Zealand, New Guinea, Japan, and East Africa. Moreover, since the completion of the Suez Canal, it has increased, like the Sharks, in the Mediterranean, though

* 'Proceed. Zool. Soc.' March 4th, 1902.

† "Sull' Origine delle Perle," 'Est. dal Cimento,' fasc. iv. Torino, 1852.

‡ 'Rapport, Pêche et la Culture des Huîtres Perlières.' Paris, 1885. *Vide* also 'Perles et Pintadines,' par M. Picquenot. Tahiti, November, 1903.

§ Prof. Herdman found the same form of *Tetrarhynchus* larva in this as in the Pearl-Oyster.

it has to be remembered that it was formerly known in the eastern part of that sea and off Morocco.* Besides the foregoing, pearl fisheries are also carried on in the Gulf of Mexico, various contiguous islands, in Panama, and California. The true Pearl-Oyster (*M. vulgaris*) is a comparatively small species, but has a beautiful pearly lustre. Like the larger pearl-shells, it is fixed by a byssus or beard (as in the Common Mussel), whereas the Tangle Oyster (*Placuna*) has none.

In addition, two other forms of Oyster are conspicuous in Australian waters, viz. the "black lip" and the "silver or gold lip," and both produce pearls, whilst they are valuable in other respects. The latter shell reaches nearly a foot in diameter, and may weigh ten pounds. A third Australian form is the "Shark's Bay" shell.†

Similar Pearl-Oysters are found at the Cape, West Indies, and both sides of Central America.‡ In some of these the pearls (e. g. *M. cetra*, Reeves) are valuable, whilst the shell is less so, the reverse being the case in others. Moreover, S. Grand§ is of opinion that in shallow water the shells are small, but pearls more frequent; whilst in deep water the shells are more valuable, but the pearls fewer.

In our own seas the pearl-producing species are few in number, and their pearls of little value. One of these occurs in vast numbers viz. the Common Mussel, whilst the larger Horse-Mussel is not uncommon in deeper water. The great majority of the pearls in the former are white or dull white, a few being bluish or mauve, and some blackish blue. In the Horse-Mussel they often have a nacreous lustre, and may be fixed like tears to the valves.

On the other hand, two forms, viz. *Margaritana* and *Anodonta*, have long been known in the fresh waters of Britain and of Europe for the beauty of their pearls, and the vast variety and great numbers of the *Unios* of American fresh waters have a similar distinction.

Formation of Pearls.—One feature all pearls have in common,

* M. Raoul Postel (quoted by M. Grand).

† Fine examples of these have been presented to the Museum of the University by Mr. J. R. Josh, M.A., B.Sc.

‡ Fisheries for these go on from July till October.

§ *Op. cit.*

viz. their origin from the cells of the mantle, the soft outer layer or envelopment of the shell-fish, and the structure which secretes the shell itself. The latter is composed of three layers—an outer chitinous or horny layer (periostracum), a calcareous middle or prismatic layer, and a calcareous inner or nacreous layer. The middle layer is formed of prisms in vertical section, and in horizontal section the areas are hexagonal or polygonal. It is chiefly composed of calcium carbonate and calcium phosphate. The inner or nacreous layer is similar in chemical composition, and consists of thin layers or plates of the secretion, which, as the illustrious Sir David Brewster showed, are so arranged as to cause interference with the rays of light, and thus give rise to the iridescent pearly lustre of the surface. Recent observers, such as Biedermann, insist that the calcareous substance of the shell can only be deposited on the organic basis (conchyolin), which will be alluded to subsequently, and the same holds with regard to pearls. Indeed, some, such as Möbius, consider that a pearl represents the shell with its coats reversed—having in the centre the nucleus, then the periostracum (horny layer)—outside which is the layer of hexagonal prisms, whilst externally is the nacreous layer. Such a view, however, is not, as a rule, in accordance with the structure.

The most recent observer, Dr. Lyster Jameson, following De Filippi, Garner, and others, holds that pearls are due to the presence of a minute parasite, which, in the case of the Common Mussel—a species he has worked out most minutely—is a fluke or Distomid of the subgenus *Leucithodendrium* (Loos), and very closely resembling *L. somateriæ* (Levinsen), which occurs in the mature condition in the intestine of the Eider-Duck. Like many other flukes—for example, that which causes the well-known liver-rot in Sheep—the life-history of the Distomid of the Mussel is complex. So far as is known at present, it occurs in its adult condition in the intestine of the Eider-Duck and Scoter (*Edemia nigra*), both of which feed on Mussels. The eggs from these give rise to young forms (larvæ, but whether by free-swimming *Miracidium* forms is unknown). Jameson thinks the eggs are carried by currents into the mouth of a common shell-fish (*Tapes decussatus*), hatch out in the alimentary canal, enter the circulatory system, and reach the course of the posterior pallial

artery. There—that is, in the mantle—they form sporocysts. The same occurs in the Cockle, only they are found along the anterior pallial artery. Within the sporocysts cercariæ are developed, with a pair of eye-spots, but without the appendage or tail so often seen in such forms. These minute parasites escape from the sporocysts, and probably by currents or by creeping find their way into the Mussels between the mantle and the shell. After creeping about on the inner surface of the shell (Jameson) they come to rest, assuming a spherical form, and are visible to the naked eye as little yellowish spots in the connective-tissue of the mantle. By and by the tissues of the host give rise to an investment of epithelium (simple columnar), which ultimately becomes the sac of the pearl (Jameson). The parasite may migrate from its original site, and thus form a double pearl or even three. In any case, the presence of this parasite acts specifically on the Mussel, and the sac around the Distomid soon secretes conchyolin, followed by the pearly substance, “and from this point the growth of the pearl probably takes place on the same lines and at the same rate as the thickening of the shell” (Jameson). The latter author points out that other parasites are not surrounded by such a sac of proliferating cells. If the larva dies, its tissues become a structureless mass, which retains the form of the parasite owing to the rigid cuticle. Calcification occurs in many cases in the tissues of the parasite before it is surrounded by the sac. Whether in any the sac is formed by an infolding of the surface of the mantle has yet to be determined.

For the completion of the life-cycle of the parasite it is necessary that either the Eider-Duck or the Common Scoter should eat the Mussels before the parasite is enclosed by the secretions of the mantle. Like Kelaart, Dr. Jameson broaches the idea of infecting the molluscs with pearl-producing parasites, just as Antonio Villa* did in relation to De Filippi's discovery.

If the origin of the Ceylonese, Australian, and other pearls is similar to those of the Common Mussel, the final hosts will probably be found in fishes which prey on the shell-fishes, such as the Great Ray, with a powerful dental apparatus, mentioned

* “Sull' Origine delle Perle, e sulla possibilità di prodotte artificialmente,” ‘Est. dal Politecnico,’ fasc. xlviii., Giugno, 1860. Milano.

by Holdsworth, at Ceylon; the two fishes with strong jaws alluded to by Bouchon-Brandely at Tuamotu; or *Balistes*, which also eats the Pearl-Oysters; or in a combination of them.

In shape pearls vary greatly. They are round, oblong, pear-shaped, kidney-shaped, drop-like, biconvex (Möbius's* pearl, which has a darker brownish-green middle mass), slightly dumb-bell-shaped, and of various irregular outlines. In colour they are white, grey, black, lilac, roseate, blue, brown, or reddish brown, and some are fancifully termed golden (S. Grand).

Whilst it may be stated generally that they are formed of layer upon layer of the iridescent nacreous secretion, yet they diverge much in appearance and structure. Thus, in a section of a decalcified pearl from the Common Mussel (Plate I., fig. 4), the field is only marked by the concentric rings of conchyolin, which are more distinct in stained preparations, and which encircle the nucleus, or it may be nuclei. The rings vary in breadth, sometimes being proportionally broad round the nucleus, sometimes narrow. Only in certain examples is a very minute reticulation apparent, and it seems to be different in character from that of the succeeding form. On the other hand, a section of a pearl from the Mussel (*Margaritana*) of the Tay (Plate I., fig. 2) presents over the entire surface a series of bold reticulations with striated walls, from the prismatic condition of the structure, whilst the concentric lines are less conspicuous. Moreover, in certain decalcified sections (Plate I., fig. 3) the radii of conchyolin are in great strength, and form a complex and beautiful series, bound at short intervals by the concentric bands. The same pearl, indeed, may present both appearances in different parts, according to the line of section. The same structure is observed in a section of either kind of pearl without decalcification (Plate I., fig. 1).

As in the Common Mussel; the pearl of the Mussel from the Tay is surrounded by a sheath of epithelium of considerable thickness (Plate I., fig. 5), and it is supported by connective-tissue and muscular fibres. At some period the sheath of the pearl becomes continuous with the outer cellular layer of the mantle, though the origin of the sheath may be independent.

* 'Sitzungs-bericht d. Gesell. Nat. Freunde zu Berlin,' 10 Jan. 1902, No. 1, p. 1.

Imperfect pearls are formed by inserting foreign bodies between the mantle and the shell, as in the case of the Chinese forms in the fresh-water *Dipsas plicatus*, an excellent account of which was given by F. Hague in 1856.* Circular pearls are similarly produced round silver wire or other substances, and Dr. Kelaart was of opinion that good pearls might be obtained by similar treatment of the Ceylonese Pearl-Oyster, but such has yet to be proved. The forthcoming Report of Prof. Herdman will probably throw light on this and other interesting points. In the same way an insect in a fresh-water Mussel, a small crab and a fish in the marine Pearl-Oyster, have each been coated with the nacreous secretion.

A recent French author, M. Léon Diguët,† attempts to draw a distinction between what he calls nacreous pearls and fine pearls, which, he affirms, differ from each other in form, aspect, constitution, and physiology. He holds that the nacreous pearl is a concretion of the mantle poured out round a foreign body, as in the case of the Chinese joss, and which under certain circumstances becomes round. It is, he says, a product of the surface of the mantle.

The fine or orient pearl, on the other hand, in contrast with such concretions, is found in the interior of the tissues in a closed chamber, in which it arrives at maturity. During its evolution it passes through a series of transformations, of which he gives three stages, *viz.* (1st) its appearance in a liquid state, as if from irritation caused by a parasite, passing (2nd) in virtue of the elements of saturation to a gelatinous stage like conchyolin; (3rd) by undergoing progressive calcification, constituting a pearl which has a series of concentric layers caused by a special mechanism. In other words, the concentric stratification is affected simultaneously with the penetration of the calcareous solution furnished by the liquids of the organism. The sac or pouch is subsequently ruptured, and the pearl is expelled.

While this ingenious theory does credit to the imagination of the author, it unfortunately is at variance with facts, for, so far

* 'Journ. Roy. Asiatic Soc. of Great Brit. and Ireland.' Published also by Von Siebold in 'Zeit. f. w. Zool.' Bd. viii. pp. 439-454, Taf. xix. and xx.

† 'Bullet. de la Soc. Centrale d'Agricult. et de Pêche,' July, 1899.

as is known, no one ever saw a pearl in the liquid condition here described.

The uncertainty concerning the origin of pearls is probably responsible for some of the statements as to their position in the animal. Thus some record their occurrence in the organ of Bojanus (De Filippi); others, as Bouchon-Brandely (Secretary of the College of France), locate them in the reproductive gland, in the adductor muscle,* in the transverse muscle, as well as in the mantle. Some pearls are found free in the cavity of the shell-fishes, both marine and freshwater—and, indeed, the native divers in Ceylon were sufficiently acquainted with this fact. In this connection it was formerly the custom of residents on the banks of rivers in which *Unios* abounded to drag the bottom for free pearls.†

It can easily be understood also how, when the surface of the pearl projects from its sac, it becomes fixed by the exposed part to the inner surface of the valve. Moreover, it sometimes happens that the pearl becomes embedded in the calcareous mass of the valve during growth, so that all trace of it disappears, only to be again brought into view when the valves are being cut by machinery into discs for buttons. Valuable pearls have thus been procured.

Chemical Composition.—Whilst the nacreous layer of the Common Oyster, according to Schlossberger, contains 94 to 98 per cent. of carbonate of lime, and only 0·8 to 2 per cent. of nitrogenous organic matter, the true Pearl-Oyster has in the same layer only 87 per cent. of carbonate of lime, whilst the organic matter reaches 11 per cent. The hardness of the pearl, which exceeds that of crystals of carbonate of lime, is due to the large proportion of organic matter. This hardness is illustrated, for instance, by the methods of the native dealers in Ceylon,

* *Vide*, in this connection, Victor Audouin's 'Observat. pour servir à l'histoire de la Formation des Perles.' Extr. des Mém. du Mus. d'Hist. Nat. Paris, 1828.

† *Vide* "Pearls and Pearl-Fisheries," M. Weber, 'Bullet. U.S. Fish. Com.' vol. vi. p. 321, 1886; C. T. Simpson, "The Pearly Freshwater Mussels of the United States," 'Bullet. U.S. Fish. Com.' vol. xviii. pp. 279-288. Also H. M. Smith, "The Mussel Fishery and Pearl Button Industry of the Mississippi River," *ibid.* pp. 289-314, 1899. See also J. Lawrence-Hamilton, M.R.C.S., 'Pearl and Mother-of-Pearl Industries.' Brighton, 1902.

who, by a hammer, fix in wood the small pearls they are about to drill; and Dr. George Harley's experience was similar. Dealers also use their teeth to distinguish between real and fictitious pearls.

In the analyses of pearls made in 1888 by Dr. George Harley,* it was found that British, Australian, and Ceylonese pearls all agreed in consisting only of calcium carbonate, organic matter, and water. There was a total absence of magnesia, and of all the other mineral ingredients of sea-water. No phosphates occurred in them (though Rudler says they are present (Encyclop. Brit.)). His (Rudler's) analysis was 91·72 per cent. of carbonate of lime, 5·94 of organic matter, 2·28 of water, and 0·11 loss; and he observes that mother-of-pearl (that is, the nacreous layer of the shell) contained less than half the quantity of organic matter the pearl did.

Age of Pearl-bearing Shells.—Few pearls occur before the third year in the marine Pearl-Oysters; indeed, it is considered that shells which are five years old offer the best field for pearls. From the fifth to the sixth year the Pearl-Oyster becomes more valuable, especially so in the seventh year; the Japanese, indeed, have them up to the ninth year. In the fresh-water forms, such as the Mussel of the Tay, pearls occur in small shells, but it does not follow that the shell is very young. The Americans consider from three to five years as the fruitful period for pearls in their fresh-water Mussels.†

Frequency of Occurrence of Pearls.—The frequency of the occurrence of pearls in the various marine and fresh-water shells is fixed by no law. Hundreds of pearl-shells may be examined without finding a single pearl; but, on the other hand, a single Ceylonese shell will occasionally produce a pearl worth a thousand pounds. An experienced pearl-fisherman of the Tay considered that perhaps one in a hundred contained a pearl. In a group of thirty-one examined by Mr. Alex. J. H. Russell, M.A., fifteen had no pearls, and sixteen had one or more; so that nearly 50 per cent. in this instance had pearls of a kind, for they were of no value. Of these eight contained

* 'Proceed. R. S.' vol. xlviii. p. 462.

† Prof. Herdman thinks there is little or no superficial increase of the shells after the fourth year, though they may grow thicker. *Op. cit.*, p. 186.

only one pearl, four had two, two had four of different sizes. The next collection of Mussels, however, and which exceeded the former in number, did not contain a single pearl. The former series came from a curve of the Tay, which has always been rich in pearls, and abounds in Otters. The Otter, like the Raccoon, Mink, and Musk-Rat of North America, probably preys on the the Mussels (Jameson), and it may be that the adult stage of the parasite will be found in it. In North America, where fresh-water Mussels abound, hogs are very fond of them, going into the streams when low and rooting them up. Crows likewise carry them up trees, and drop them to break the shells. In the rivers they are eaten by Cat-fishes.

In order to test the frequency of their occurrence in the Common Mussel of the Eden, Mr. Alex. Russell, M.A., examined 700.* Of this number 620 were large and 80 small—some very small—Mussels. Of the 620 large Mussels, pearls were found in 280—that is to say, 340 had no pearls; and of the 80 small Mussels, 20 had pearls, and 60 were devoid of them. In dealing with the pearl-bearing forms both large and small, and which thus number 300, the following table gives the precise number of pearls in each series, as well as the totals;—

No. of Pearls.	1	2	3	4	5	6	7	8 or more Pearls.	Totals.
Large Mussels	186	67	81	15	7	14	8	7	280
Small „	12	—	5	—	1	—	—	2 (12 pearls)	20
Totals	148	67	86	15	8	14	8	9	300

The proportion of the 300 pearl-bearing Mussels to the total number (700) is thus 42·8 per cent., but if the large Mussels alone are considered, the proportion is higher, *viz.* 45·1 per cent., which indicates that the Common Mussel more or less follows the same law as the Pearl-Oyster, *viz.* that the older forms produce most pearls. Indeed, the number of pearls in the very small Mussels at St. Andrews is noteworthy, and may be explained by the fact that the very small are not necessarily young Mussels,

* 'Ann. Nat. Hist.' ser. 7, p. 549, June, 1908.

as a glance at the crowded masses of minute forms on the rocks show. As formerly pointed out by Dr. Wilson and myself, though stunted they are ripe, and it may be the same explanation will suffice for the pearls, which occurred in 25 per cent. of them. It will thus be evident that pearls appear in the Common Mussel as frequently as in the Pearl-Oyster, and more frequently, as a rule, than in the fresh-water Pearl-Mussel, but generally their lack of lustre and beauty makes them of little value.

In connection with Dr. Lyster Jameson's views that the Eider-Duck and the Scoter are the final hosts of the parasites which form the nuclei of the pearls in the Common Mussel, it may be stated that both occur in the estuary of the Eden, and feed on the Mussels. It is possible also that other species amongst the many birds frequenting the Mussel-beds, such as the Oystercatcher, may be found to harbour the same parasite.

In relation to the statement of Sir E. Home—that the ova of the Mussel form the nuclei of the pearls in the mantle—is the fact that pearls are found in the males, where no eggs are, as well as in the females.

Mode of Capture.—Marine pearls, whether from the true Pearl-Oyster or the larger bivalve pearl-shells, are procured by diving, since the shell-fishes inhabit water of some depth.* Each boat has relays of men, so that as little time as possible is lost during the season, which is regulated in most places by statute, so as to prevent impoverishment of the beds. In general, a rest of four years is given for each bed in Ceylon. Many descriptions of the fishery in Ceylon have been given, such as those of Albrecht Heerport in 1666, Mr. le Beck in 1797, and Mr. Percival in 1803. The account of Mr. le Beck of the fishery in one of the most productive seasons in the Gulf of Manaar, in Ceylon, is of special interest.† The fishing commences in February, and is carried on for a period of thirty days, according to agreement. His graphic description of the transformation of the barren region of Condatchy—usually so quiet—into a bustling place, where thousands of people of different colours, countries, and occupations congregate, the tents and huts on the seashore with

* From Prof. Herdman's observations the usual depths appear to range between four and fourteen fathoms. *Op. cit.*

† 'Asiatic Researches,' or 'Transactions of the Bengal Society,' 1799.

shops or bazaars in front, and the richly laden boats returning in the afternoon, would in many respects suit modern times. Each boat held ten divers, but only five sets of stones of 80 lb. weight (as sinkers), and five nets (as collectors), as only half of the men are at work at a given time. The divers remain below from "two to three minutes," "rarely four to five minutes,"* and bring up about one hundred Pearl-Oysters, which are of small size—from 2½ to 3 in. at most. An Australian pearl-shell diver will bring up 30 lb. weight each time, but each shell-fish is from 6 to 10 in. in diameter, and weighs 2 lb.

Besides the fishes which eat the pearl-shells, the valves are attacked by a boring sponge, by marine worms, by *Murex*, and "Pholades," and occasionally small hard shells, such as *Cerithium*, get between the edges of the valves and prevent closure, so that Hermit-Crabs get in and devour the soft parts. Starfishes are equally destructive, as in the case of the Common Oyster. Pea-Crabs are also found internally. Externally are various polyps (Zoophytes), Ascidians, and Serpulids.†

Pearl-fishing in fresh waters is carried on chiefly when the rivers are very low in June, July, and August—at a time when such rivers as the Tay can in most places be forded. The bed of the river is covered with rough stones, between which patches of gravel or sandy gravel occur. In these patches the Pearl-Mussels are found—the broader (anterior) end of the shell, with the mouth and foot, sunk deeply, whilst the posterior end, with the dark brown fringe of the mantle, projects above the surface. Respiration is thus readily carried on, and the currents likewise convey food. In rivers such as the Tay the ripples on the surface render it difficult to see objects on the bottom. Accordingly the pearl-fishers carry a rude kind of water-telescope, which enables them to take in a considerable range of the bottom, and readily observe each shell, which is removed by a forked stick, or an iron instrument of similar shape. In many places the stones in the bed of the river are covered by a bright

* Prof. Herdman states, from personal observation, that none reached two minutes, and few over a minute and a half. *Op. cit.* p. 64.

† Prof. Herdman mentions, amongst other natural enemies, *Modiola barbata*, which, when in quantity, smothers the young Oysters. *Op. cit.* p. 121.

green coating of the fresh-water Sponge (*Spongilla lacustris*, not *fluviatilis*, as might be supposed), and insect larvæ and their tubes abound in the gravel. Eels are the only fishes observed. A great and unnecessary waste of shell-fish life takes place from the primitive methods still used to obtain the pearls, both in this species and in the marine forms. Instead of slitting the two adductor muscles, or the single one in the Pearl-Oyster, a screw-lever can be used for opening the valves sufficiently for inspection. The molluscs can thus be returned to the water, and may develop another pearl.

Artificial Pearls.—Jaquin made artificial pearls for Catherine de Medicis of glass, and with the silvery scales of *Cyprinus alburnus*. Similar artificial pearls were in the London Exhibition of 1851. At the present time their manufacture by a different process is carried out extensively in Paris.

Pearls as Medicine.—Besides ornamental purposes, in olden time (a century ago) pearl-powder was used as a medicine for many diseases, just as powdered ivory and musk lingered till our own day. Some pearls, again, were reduced to powder or chunam, to be used with betel-leaf and areca-nut as a masticatory.

Reproduction.—Considerable obscurity still remains in regard to the spawning of the Pearl-Oysters. Léon Diguët thinks this occurs in autumn. The Japanese Pearl-Oyster, again, spawns from June to August.*

Mother-of-Pearl Industry.—A few words may now be said about the mother-of-pearl industry. The valves of the various Pearl-Oysters are extensively used in papier-mâché work, in inlaid work, and in the decoration of ecclesiastical vestments in Russia. The Chinese, Siamese, Japanese, and Turks are great in inlaid work, and they also employ powder made from *Trochus* and *Haliotis*. In our own country a large trade is carried on in button-making, in the manufacture of breast-pins, earrings, cane- and umbrella-handles, card-cases, boxes, studs, napkin-rings (*Trochus*), artificial catseyes, and beads. Cameos are also carved on mother-of-pearl shells (such as the dark varieties, *e. g.*

* Prof. Herdman's observations (*op. cit.* pp. 125, 126) would seem to point to May as the central spawning month, though many may spawn earlier and later, as with the Common Mussel.

Tahitian pearl-shells). The remarkable Fiji Island dresses of shells made of sections of a large Pearl-Oyster are still in some museums.

The iridescent colours of fossilized shells are retained in the ammonites from the Jurassic and cretaceous limestone (Lumachelle marble), which resemble in their lustre the fire-opal from Mexico.

From the fresh-water *Unios* little portmanteaus, satchels, &c., are formed, and they are very beautiful when both the exterior and interior are perlaceous.

We have thus taken a rapid glance at a comprehensive subject—a glance sufficient, however, to show the vast resources of nature for scientific investigation and scientific culture. The great variety and beauty of pearl-shells and their pearls have for ages proved sources of the deepest interest to man, both savage and civilized, and the recent discoveries in regard to the formation of pearls indicate that that interest is by no means diminished as time advances. Here in St. Andrew's we are in the midst of a fine field for experimental work in connection with pearl-formation, both in the fresh-water Mussels of the Tay and the marine forms in the estuary of the Eden. The task would involve labour and care, but it would not be more complex than those recently carried out in connection with the mosquitoes and malaria, or than some of the more intricate bacteriological investigations of the day; whilst a successful result might lead to other advantages which do not usually fall to the lot of scientific workers.

Note.—Since the foregoing was written, Prof. Herdman's first volume of important observations on the Ceylonese Pearl-Oyster has been published,* and in this he shows that the most important cause of pearl-formation is a larval cestode of the *Tetrarhynchus* form, the free embryos of which become encapsuled in the Pearl-Oyster, the late larval stages being in File-fishes which eat the Pearl-Oysters, and, lastly, the adult in a large Elasmobranch (*Trygon*).† Prof. Giard‡ has also pointed

* "Ceylon Pearl Fisheries," &c. Roy. Soc. 1903, pp. 11-18.

† 'Nature,' Dec. 10th, 1908.

‡ 'Comp. rend. Soc. Biol.' Oct. 31st, 1908, tome lv. p. 1222, with figs.

out that M. G. Seurat has just found a cestode parasite as the cause of pearl-formation in the region of the Gambia. An older stage, moreover, occurred in *Balistes*.

It is interesting also to observe that the behaviour of the Pearl-Oyster spat* is in most respects the same as that of young Mussels, even to the coating of seaweeds and zoophytes, and their habit of detaching themselves at will.

For the photographs of sections of pearls, I have to thank my colleague, Prof. Musgrove, who kindly undertook the work. Figs. 2, 3, 4, and 5 were printed by Mr. A. W. Brown, of the Gatty Marine Laboratory.

PLATE I.

Fig. 1.—Section of a Tay pearl in its natural condition. The radiating and concentric lines are boldly indicated. This specimen was presented by B. C. Cox, Esq., of St. Andrews. Magnified.

Fig. 2.—Section of a Tay pearl after decalcification. The whole field is minutely reticulated, and traces of two nuclei are indicated. Magnified.

Fig. 3.—Section of a decalcified pearl from the Pearl-Mussel of the Tay, made like the former by Mr. A. J. H. Russell, M.A. The radiating lines of conchyolin are very prominent, whereas the concentric lines are less so. Magnified.

Fig. 4.—Section of a decalcified pearl in its capsule from the mantle of the Common Mussel. In this the conchyolin forms fine concentric striæ around the nucleus. No radiating lines are visible. The ova of the Mussel (a female) fill up the mantle beyond the capsule of the pearl. Magnified.

Fig. 5.—Section of a decalcified pearl (small) in the mantle of a Pearl-Mussel from the Tay.† It is surrounded by a well-formed cellular capsule. Minute reticulations and concentric lines of growth are visible, as well as several nuclei. Magnified.

* 'Nature,' Dec. 10th, 1903, p. 69.

† I have to thank Mr. Lumsden, the Superintendent of the Tay Salmon Fisheries, for his courtesy in forwarding living examples of the Pearl-Mussels.

NOTES ON THE SEAL AND WHALE FISHERY FOR 1903.

By THOMAS SOUTHWELL, F.Z.S.

THE prospects for the Newfoundland sealing in the season of 1903 were good from the first, and it was brought to a successful conclusion without any untoward circumstances, or a repetition of the unpleasant features which marked the preparations for the previous voyage. The fleet, by the addition of the 'Grand Lake' and the 'Windward,' was increased to twenty-two vessels, six of which left St. John's on the 10th of March with the good wishes of all concerned.

The eastern Seals were found about forty miles N.E. of the Funks, and, as they covered a comparatively small area, and lay very thick, notwithstanding the ice being heavy the work proceeded rapidly; the Hooded Seals, however, were very scarce.

The first to return was the 'Virginia Lake,' on the 28th of March, with 22,677 Seals, to be followed on the 29th and 30th by the 'Aurora' and 'Greenland,' both well-fished; others arrived in quick succession. The 'Virginia Lake' found the breeding patch on the 17th, and in the two following days had the bulk of her young Seals on board, which consisted of 21,582 young, 257 Bedlamers, and 205 old Harps; also 488 young and 150 old Hoods.

The weather throughout the spring was terribly cold, and high winds prevailed; the ice was heavy, and the frozen slob thickly covered with White-coats, the patch being described as the largest seen for many years; the work for the men was therefore very heavy, and they laboured at killing and panning until overcome by sheer fatigue. As most of the vessels were well into the patch, it was speedily cut up, and after the first scramble little else was done. After getting the pelts on board they headed E.N.E. in search of Hoods. This fairly epitomises the proceedings of all the vessels of the eastern fleet.

Zool. 4th ser. vol. VIII., February, 1904.

Owing to favourable weather at this stage of the voyage, which, however, did not last long, the losses from the objectionable practice of "panning" do not seem to have been so heavy as usual; it often happens that through eagerness to secure as many Seals as possible in the short time available, many more are killed and the pelts panned than can afterwards, owing to bad weather, the breaking up of the ice, or other causes, be recovered, thus involving much useless sacrifice of life and property.

Of all the northern fleet, the 'Windward' was the most unfortunate. Although she arrived early at the breeding patch, she was unable to force a passage into the ice, and, other troubles following, she had to return with only 1185 Seals. The young Seals were in excellent condition, the average weight of the fat being 40 to 46 lb.

Of the Gulf sealers the report is not so good, the four vessels only securing about 84,000 Seals between them. The captain of the 'Newfoundland' reports that he first struck the Seals on the 12th March, eight miles south of the Bird Rocks, but was unable to get near them. All through the spring the vessel was jammed more or less, and it was not till the 23rd or 24th of March that any number of Seals were taken; these were quite in the centre of the Gulf. "The ice," says Capt. Farquhar, "was in enormous sheets three to ten miles wide, and the weather so bad that men could not work. Had the weather been fine a big catch would have been assured, but the distance travelled by the men was too great." His final result was 10,530, almost all young Harps. The 'Harlaw,' with the 'Algerine' and 'Nimrod,' found the Seals off Cape Anguille, but they all became jammed, and, although there were Seals all around, the ice was so heavy that they could not be got at. The 'Algerine' was the most fortunate of the Gulf sealers; she had about 8000 young Harps, and 2000 young and 2200 old Hoods, some of the latter being very heavy. Her catch altogether numbered 12,820, and but for the heavy nature of the ice might have been larger still. As it was, her nett weight was 331 tons, a trifle more than the 'Iceland's' 16,337 young Harps, although they also were very fine.

The average take of the twenty-two vessels was 14,444 Seals, twelve of them being above that number, and ten below. Twelve

vessels had more than 15,000, three between that number and 10,000, and seven less than 10,000. The 'Aurora' headed the list with 26,069 (1652 of which were old and young Hoods), and the 'Windward,' for the reasons already explained, brought home only 1185. The total catch of the steamers was 317,760 Seals, valued at £89,958, against 274,539, estimated at £80,525 in the season of 1902. To these must be added those taken in the northern shore fishery, and by the schooners on the west coast.

Commercially, the past season must have been a very remunerative one; the trade has drifted virtually into the hands of three firms, and fresh markets are opening for the products, both oil and skins. The editor of the St. John's 'Evening Herald,' commenting upon the season's fishing, remarks:—"The American demand for skins is now so great, consequent upon the discovery of a new and improved process of tanning them, that an advance of twenty to forty cents. in the price of them, according to size, is confidently expected in the near future." Instead of depending upon the English market alone for the disposal of the oil and skins, the American demand is said to be for more than the entire catch, and the probability is that the fleet will be further augmented. "Years ago Seal-oil fetched only £18 per tun in London, whereas it now fetches £28, and skins then were worth only 2s. 6d. each, whereas they now realize 8s. 6d. each. . . . In the face of these figures it is clear that the sealing industry will take on a new lease of life, so to speak"; but the look-out for the Seals themselves, owing to this increased impetus in their pursuit, is a black one. That the supply has not shown signs of exhaustion hitherto is difficult to understand, and seems to point to a reserve of breeding Seals, the whelping haunts of which have not hitherto been discovered.

Happily no accidents or untoward incidents have this season to be reported, in addition to the hardships incidental to this arduous and perilous enterprise.

The 'Terra Nova' has been purchased by the Government to join the 'Morning' as a sister relief ship to the 'Discovery,' now engaged in Antarctic research. She sailed for the south on 26th August, 1903, and the 'Windward' goes to replace the 'Vega,' whose loss I shall have to record below.

The whaling fleet again consisted of five vessels, the 'Vega' taking the place of the lost 'Nova Zembla'; to these must be added the ketch 'Alert' of ninety-seven tons, now wintering in Pond's Bay, and the 'Greda,' a chartered Norwegian schooner, which brought some produce from Cumberland Gulf station. All these, with the exception named below, hail from Davis Strait. The Greenland Seas were again unvisited by the British whalers.

Once more the pitiless ice of the Polar Seas has claimed its victim; in the season of 1902 it was the 'Nova Zembla,' which went to pieces in Dexterity Fjord. In the past season the 'Vega,' on her first whaling voyage from Dundee, was crushed in the dreaded floe of Melville Bay, and went down so quickly that her crew had barely time to take to their boats and escape.

The first vessel to arrive home was the 'Active,' which reached Dundee on the 20th of October from the scene of her operations in Hudson Strait and the neighbourhood of Southampton Island, where her owners have a winter station. After visiting the mines and taking on board the talc there awaiting her, she proceeded to the station on Southampton Island, which was reached on the 17th of July, and thence to 'Kikerton' (the native name for any group of islands), where all her five Whales were taken. The bone of two, but not the blubber, was obtained by barter from the natives, two were killed by the ketch 'Ernest William,' and one was captured at the beginning of September by the crew of the 'Active.' One of the Whales was small, with only five feet of bone, another of six feet, and the remaining three yielded bone of over nine feet, one being a fine fish of 10 ft. 8 in. bone, a large size for this locality. The capture of this last Whale was rather an exciting event. When harpooned it made direct for the loose ice, and soon ran out all the lines; the crew, however, cast off and buoyed the line, and, rowing round to the other side of the floe, again picked it up. Finally, after eight hours' exertion, they succeeded in securing their valuable prey. The 'Active's' voyage was a very successful one; she brought home the produce of 5 Black and 84 White Whales, 78 Walruses, 125 Seals, and 46 Bears, yielding 26 tuns of oil and 41 cwt. of bone; also the skins of 10 Musk-Oxen and 127 Foxes, which were obtained from the natives.

The Liverpool steamer 'Eldorado,' engaged in the fur trade, struck a sunken rock off the George River, in Ungava Bay, at the entrance of Hudson's Bay, and foundered at once, her crew of forty-seven men barely escaping with their lives. After great hardship from exposure to cold and hunger, and a 600-mile tramp, they reached the Temiscapping Railway, and finally arrived safely at Montreal. Such are the dangers of this ill-charted sea.

The east side fishing-grounds were visited, but not a single Whale seen. The four vessels therefore proceeded north to Melville Bay, where they were all beset. The 'Vega,' a fine vessel of 357 tons gross, built at Bremerhaven in 1872, and notable as the vessel in which Baron Nordenskjöld made his wonderful north-east passage from the North Cape to Berings Strait in the years 1878-9, was on her first voyage from Dundee, which port she left on the 11th April, reaching Melville Bay towards the end of May; here she was beset, and after battling with the floe unsuccessfully for seven days, on the night of the 31st of May the ice penetrated her side, and she went down so suddenly that those of her crew who were in their bunks had barely time to escape, scantily clothed and without boots and stockings. Fortunately her seven boats had been got out, although there did not then seem to be immediate cause for alarm, and the crew of forty-five, half-clothed and badly provided with provisions, took to the boats off Wilcox Point, where the wreck occurred, and, after 6½ days' exposure in open boats to cold, dangerous navigation, and terrible weather, they reached the settlement of Upernivick. After staying here seven days, part of the crew started in two boats to intercept the steamer 'Nov,' which leaves Copenhagen twice a year for the east side Davis Strait settlements, and, after having travelled 800 miles in open boats, they fortunately found her at Egedesminde, and were landed at Abërdeen; others reached Godhaven, and were conveyed to Copenhagen by the Danish mail-packet, and arrived at Dundee by the 'Rona' on 10th September.

The remaining three ships were also fast in the ice. The 'Eclipse,' which was slightly in advance, was the first to escape after very rough handling, but sustaining no material damage. The 'Diana' was not so fortunate; on the 6th June she was

badly nipped, and her rudder smashed. Three days later her spare rudder was also rendered useless, and she had to avail herself of the assistance of the crews of the other vessels to make good as far as possible the damages sustained. After much blasting and cutting the two ships got free, and pursued their voyage northward, having been fast for seventeen days.

Not so, however, the 'Balæna,' between whom and the open water there intervened a solid barrier of ice a mile in extent, defying all their efforts to force a passage through ; no sooner was a space cut than the floe closed in, rendering fruitless all their efforts, and her rudder was carried away by the pressure. It was not till the 15th August that she got clear of the ice, having been imprisoned for seventy days. This misfortune came after having her foretop-gallant mast and mizzen-topmast carried away on the 26th April in a gale off Cape Farewell. But the gallant crew, notwithstanding the severe ice work during their long detention, were not neglectful of the main object of their voyage. On the 28th July a Whale was seen, and, dragging the boats a mile over the ice, they gave chase, but returned empty-handed. A second attempt on the same day was equally fruitless. On the 30th several Whales were seen, with a like disappointing result, and the next day they actually got fast to one, but the harpoon drew. On 1st August yet another fish was lost. Could anything be more disappointing to the imprisoned crew? It was not till off Cape York that the 'Balæna' killed her first and only Whale, a fine fish of 10 ft. 8 in. bone, and she bore up for home on the 31st October, after having visited the west side fishing-grounds, where plenty of Whales were seen, but the sea was too heavy to permit of the boats putting off.

The 'Balæna's' catch consisted of 1 Whale, 4 White Whales, 2 Walrus, 6 Seals, and 35 Bears, yielding 14 tuns of oil and 18 cwt. of bone.

We left the 'Eclipse' just escaping from the ice in Melville Bay. Thence she made good progress to Cape York, where she had another slight nip, but reached the station in Pond's Bay on 3rd July. In the middle fishing-grounds a small Whale of 5-ft. bone had been captured, and on Sept. 20th a large Whale near Coutts Inlet, 11 ft. 8 in. bone ; but it was on the 22nd October, at Katerhead, that she met with the crowning stroke of good

fortune, killing two other Whales of 12 ft. 3 in. and 11 ft. 3 in. respectively, thus making a brilliant finish. A week later she bore up for home, and arrived on the 15th November, having the produce of 4 Black and 33 White Whales, 1 Walrus, 36 Seals, and 38 Bears, yielding 49 tuns of oil and 68 cwt. of bone.

The 'Diana,' after her exciting passage through Melville Bay, reached the north water on 26th June. Her first Whale was seen and lost on 6th July, but the next day they were fortunate enough to secure a large fish, yielding 12 ft. 6 in. bone, and a second very small Whale of 4 ft. bone on the 20th July in Pond's Bay. She reached Dundee on the 15th November, having on board 2 Black and 4 White Whales, 3 Walrus, 18 Seals, and 16 Bears, representing 23 tuns of oil and 26 cwt. of bone.

The features of the voyage have been the bad weather experienced, and the heavy character of the ice. Many Whales were seen, and doubtless more would have been captured had it been possible to go in pursuit of them. With three exceptions they were all very fine fish.

The total produce, including 2 Black and 4 White Whales, 12 Walruses, 3044 Seals, 4 Bears, 83 tuns of oil, and 22 cwt. of bone, brought home from Cumberland Gulf station by the 'Greda,' was as follows:—14 Black Whales, 79 White Whales, 107 Walruses, 3229 Seals, and 157 Bears, yielding 145 tuns of oil and 175 cwt. of bone, of the approximate value of £28,350, against a like valuation of £32,420 in the previous season. Bone is now selling at the enormous price of £2700 per ton, irrespective of size, which offers a strong inducement to risk the expensive outfit, and to endure the perils and hardships of the voyage. No efficient substitute for whalebone has yet been discovered for stiffening ladies' dresses and whip-handles, its chief uses, and the price seems likely to go even higher still.

I have no precise information as to the number of Bottle-nosed Whales killed by the Norwegians, but, judging from the quantity of this season's oil on the market (about 1600 tuns), it could not be far short of 2000.

The Newfoundland Finwhale fishery continues to be profitable. The spring fishery, commencing in the month of March, is now pursued in Hermitage Bay, where up to July the "Sulphur-bottom" Whales (doubtless *B. sibbaldii*) are killed. After the

middle of the latter month Notre Dame or Green Bay is resorted to in search of "Humpbacked" (*Megaptera longimana*?) and "Finwhales" (*Balenoptera musculus*?). About the month of October these Whales become scarce, and finally leave the coast. The following figures, taken from the Report of the Newfoundland Financial Minister's Budget speech of 1903, show the value of the oil and bone produced in each season :—

Years.	Tuns of Oil.	Value of Oil.	Value of Bone.
1897-8 ...	27 ...	1,340 dols. ...	241 dols.
1898-9 ...	211 ...	14,439 ,, ...	1,089 ,,
1899-0 ...	430 ...	34,604 ,, ...	1,814 ,,
1900-1 ...	635 ...	54,221 ,, ...	13,550 ,,
1901-2 ...	1,275	112,859 ,, ...	12,285 ,,

Of course the bone is short and of very inferior quality.

The value of the Finwhale fishery from the Norwegian ports has fallen off from 1,320,600 kroner in 1897 to 498,000 kroner in 1900, and great complaints have arisen from the fishermen as to the disturbance produced in their fisheries by the operations of the whalers. The Parliament therefore, after due inquiries, has forbidden whaling along the Norwegian arctic coast within seven kilometres from the land for ten years from February next. Probably owing to scarcity of the Whales, and certain restrictions already in force, establishments were extended first to Iceland, then to the Faroes, and lastly to Shetland, where two stations have been established by Norwegian companies at the head of Ronas Voe, and a new station is to be opened in the coming season at Collafirth. Last year the two Ronas Voe companies killed 126 Whales in all. A writer in the 'Shetland News' states that in 1902 the united Norwegian fleets of about fifty-seven vessels accounted for nearly 2500 of these Whales. It does not seem probable that the supply of these animals will long sustain such a strain; they will surely soon be killed out, or desert the seas where they meet with such persecution, and this, in addition to the complaints raised by the fishermen, must render any extension of the industry very precarious.

A feature in the year's record of things cetacean has been the appearance of a considerable "school" of Sperm-Whales in the North Atlantic. In August, 1901, a male 61 ft. long was found dead, and towed into Ronas Voe; but on the 26th June last the

Finwhale fishers from that port actually met with a "school" of five, one of which, a male 68 ft. long, they captured, the remaining four making their escape.

Mr. Percy Bicknall has been good enough to allow me to avail myself of the inquiries he has made as to the captures of Sperm Whales by the Iceland and Norwegian whalers, which give the following results. No dates are given as to when they were seen, nor the precise number of which the "school" consisted, but one letter sets it at thirty. Mr. Bicknall believes that at least six were killed, and one found dead, and that the following dates are approximately correct:—

June 20th.—Two out of a numerous herd, in lat. 63° N. One, 54 ft. long, taken eighty-four (or twelve Norwegian) miles S.S.E. of Reidarsfjord. "No others seen at the same time."

June 27th.—One taken (two or three others seen), lat. 61° N. This is probably the Ronas Voe individual.

July 14th.—One taken (two others seen) in lat. 63° N.

August 14th.—One taken (alone), same locality as the single one, on June 20th; length, 60 ft.

All six are described as bulls, mostly adults. They seem to have dispersed in the deep water between Iceland and Norway, in about the latitude of Trondhjem. From one of the two killed on 20th June a lump of ambergris weighing about $4\frac{1}{2}$ lb. was taken. Mr. Bicknall tells me that in 1898 a Mincing Lane merchant had a piece of ambergris weighing 270 lb., which was sold in Paris for something like 85s. per oz., or £18,360. The price of ambergris varies considerably, but that of good quality averages about 60s. to 80s. per oz.

My best thanks, as usual, are due to my obliging correspondents, Mr. Robert Kinnes, of Dundee, and Sir Richard Thorburn, of St. John's, Newfoundland; also to the editor of the St. John's 'Evening Herald,' for their kind assistance.

ORNITHOLOGICAL NOTES FROM MID-WALES.

By Professor J. H. SALTER, University College, Aberystwith.

THE following notes form a continuation of a series, referring chiefly to the neighbourhood of Aberystwith, which has appeared in 'The Zoologist' at intervals during the past ten years.

1902.

January 7th.—An unusually large flock of from two to three hundred Redwings. Owing to absence of snow, scarcely any Fieldfares seen this winter.

28th.—Mr. C. E. M. Edwards, of Dolgelley, informs me that Black Game are upon the increase in that neighbourhood. A Grey Hen reared a brood upon Cader Idris in the summer of 1901.

February 9th.—Two Tree-Sparrows again at the stackyard where I first met with this species, which had not previously been recorded for Cardiganshire (Zool. 1902, p. 25). With reference to the distribution of this bird in North Wales, Mr. H. E. Forrest writes:—"Last May I identified the Tree-Sparrow—quite a little colony of them—at Llanrwst. It also occurs at Conway, Colwyn Bay, St. Asaph, and in Anglesea, along the Shropshire border of Montgomeryshire, as also in parts of Denbighshire." As regards the Lesser Whitethroat, Mr. Forrest states that "this bird is more plentiful in Montgomeryshire than elsewhere in North Wales, particularly along the Severn Valley as far west as Newtown. It also occurs in several parts of Flint and Denbigh; though local and nowhere numerous. Capt. Swainson heard it in July, 1895, at Llanidloes. Its numbers vary immensely in different years; it was specially numerous in 1895 and in 1901." Mr. H. S. Davenport tells me that he found this species quite abundant last May at Llanuwchllyn, in the vicinity of Bala Lake. Six pairs were nesting close to the village.

10th.—Mr. Feilden writes of having seen a flock of about thirty Curlew-Sandpipers on the golf-links at Borth.

March 10th.—Curlews, Oystercatchers, and Redshanks very noisy after dark.

26th.—The Ravens' nest at Yr Garreg contained two newly-hatched young and an addled egg.

28th.—The heronry at Llidiardau, Llanilar, now numbers only five or six pairs.

April 23rd.—Two Swifts hawking over Borth beach—an early date for this migrant, which in general arrives with the utmost regularity on or about May 3rd.

30th.—A brood of young Grey Wagtails left the nest to-day. In this case the first eggs must have been laid during the last few days of March.

May 3rd.—Cirl-Buntings' nest with three eggs in furze.

8th.—In the hill-district noted large parties of migrating Meadow-Pipits not yet dispersed, though others were breeding.

14th.—Turnstone at the mouth of the Dovey.

17th.—A pair of Peregrines breeding in a cliff which overlooks one of the small mountain lakes. From a nest in the same rock, Ravens had brought off young earlier in the season.

19th.—While snow-showers whitened Snowdonia, made a careful search for the Twite upon the picturesque mountains of the Rhinog range, in the neighbourhood of Cwm Bychan and the Roman Steps. My quest was unsuccessful, though parts of these hills are covered with tall heather, and the locality appears in every way most suitable. Mr. D. B. Grubb, who was here at Easter, writes:—"I was interested to find Linnets, which I imagined to be Twites, amongst the heather on Rhinog Fawr." Yet no one, so far as I am aware, has yet found this species breeding in Wales.

24th.—Mr. Grubb observed Dunlin, evidently breeding, upon one of the mountain-bogs between the Yrfon and Towy (Breconshire).

25th.—Heard Turtle-Dove. This bird has become decidedly more numerous, or rather less scarce, here within the past ten years.

28th.—A pair of Wood-Wrens nesting for the third year in succession at precisely the same spot.

31st.—Found the Lesser Redpoll, which I have hitherto regarded as a winter visitor to this district, remaining to breed

in some numbers in the vicinity of the town (Zool. 1903, p. 106).

June 5th.—Amongst the Lesser Black-backed Gulls, at their colony upon the Teifi Bog, observed an adult Herring-Gull. This confirms the truth of a statement made to me some years ago to the effect that one or two pairs of *L. argentatus* nest here with the more numerous *L. fuscus*.

23rd.—Noted that young Garden-Warblers, when alarmed, drop out of the nest and hide in the undergrowth long before they are able to fly.

July 2nd.—Mistle-Thrushes already flocking.

5th.—A pair of Choughs near the Monk's Cave.

9th.—Numerous well-fledged young Herring-Gulls upon the nesting-ledges. About fifty Guillemots and a pair of Great Black-backs breeding at New Quay Head. Visited a breeding station of the Cormorant. The nests and vicinity were populous with young birds, fully fledged, and just ready to leave the ledges. Some of them, becoming nervous, took flight, but first lightened ship, throwing up their last meal of partly-digested fish, in pieces about the size of Sprats. An old Cormorant came in to feed its brood. With head down, wide-open beak, and quivering wings, it was surrounded by its scuffling, fluttering young, which put their heads one by one into its mouth and seized the savoury morsels from its pouch.

22nd.—Starlings now distributed in flocks over the mountains, accompanied by flanking parties of Mistle-Thrushes.

September 24th.—Chiffchaff sang.

26th—Stonechat singing and "chacking," as in spring.

November 2nd.—Cirl-Bunting singing.

14th.—House-Sparrows hawking gnats.

December 12th.—A Black Redstart by the College.

1903.

January 15th.—At the taxidermist's, saw the Norfolk Plover which was obtained near Towyn on the 6th inst. (see note by Mr. H. E. Forrest (Zool. 1903, p. 154)). Only one Bittern received this winter so far.

February 11th.—Saw a Dotterel, apparently a bird of the

year, said to have been shot on the hills on Sir Pryse Pryse's property last August or September.

March 10th.—Three Golden Plover near Plynlimmon, as yet showing no sign of summer dress.

13th.—Owing to the wet and rough weather, Ravens only began to lay about this date.

28th.—I hear of Black Game reappearing in more than one Cardiganshire locality. They are probably wanderers from the adjacent parts of the counties of Radnor, Brecon, and Carmarthen, where this species has always maintained itself, though latterly in small numbers.

April 2nd.—Was introduced to a Welsh haunt of the Wood-Lark. A warm southern hillside, diversified by outcrops of grey rock amongst the withered bracken, sloped to the Wye. Quite half a dozen pairs were breeding here. One could not walk far in any direction without hearing the soft flute-like note of the male bird as he sang, sometimes hovering in the air, but quite as frequently from the ground. Other pairs were chasing and coquetting. Though the birds seemed tame, and it was easy approximately to locate each nest, they were in reality very shy of giving any indication of its exact whereabouts. The site usually selected is under shelter of the dry beaten-down fern. So early a breeder is the Wood-Lark that, in spite of the wet and cheerless weather of the present spring, a nest contained much incubated eggs on March 28th; another bird was beginning to sit on April 1st.

5th.—A pair of Goldcrests have a nest ready for lining.

6th.—Swallows already crossing the bleak and dreary hill-range of the Eppynt. Mr. Forrest saw Ray's Wagtail at Rhayader. A number of dates with which I have been furnished tend to show the very early arrival of the migrants in the Wye Valley, accounted for by the fact of its being a main artery of distribution. This was exemplified in 1893, when I saw the Common Redstart some distance above Rhayader on March 29th.

11th.—A Ravens' nest near Devil's Bridge contained five young birds, which were almost fledged, a little greyish down still showing amongst the feathers. Another nest, which I heard of as long ago as 1895, contained much smaller young.

May 2nd.—A Hoopoe at the taxidermist's, said to have been obtained at Talybont.

9th.—Met with the Lesser Whitethroat in Cardiganshire, for the first time during twelve years' residence (Zool. 1903, p. 226).

11th.—A pair of Ravens skirmishing with Rooks over the Penglais Woods.

23rd.—A Cuckoo passed over calling on the wing (see discussion in Zool. 1894).

June 5th.—The Lesser Black-backed Gulls being considered destructive to game upon the Teifi Bog, it has been resolved to expel them. The keeper informed me that about 180 eggs had been gathered, and a number more destroyed. It is doubtful whether half a dozen young were brought off. Colonel Fryer, the lessee of the shooting, tells me that the only point in their favour is that they destroy Adders. It would be interesting to have this confirmed. Cuckoo's egg in a Tree-Pipit's nest.

10th.—About a dozen pairs of Lesser Terns breeding at Ynyslas. This is the only nesting site of this species on the Cardiganshire coast.

August.—Goldfinches have greatly increased in numbers in this neighbourhood, owing to a succession of mild winters, and to their being now protected throughout the year.

29th.—Swift last seen:

31st.—Chaffinch's imperfect summer song; again on September 25th.

September 13th.—Had the pleasure of meeting Mr. E. Cambridge Phillips, the veteran Breconshire ornithologist. Heard details of a recent occurrence of the White-tailed Eagle at Cantref, near Brecon, and of that of a Little Bittern at Llan-gorse Lake. Mr. Phillips showed me local specimens of the Hobby, Great Snipe, and Crossbill, Spotted Crakes from Onllwyn Bog, and (of still greater interest) the pair of Firecrests referred to in 'The Birds of Breconshire.'

16th.—Ring-Ouzels at the rowan-berries. Saw a fine Falcon (tiercel) on the wing in a remote part of the county, close to the Breconshire border.

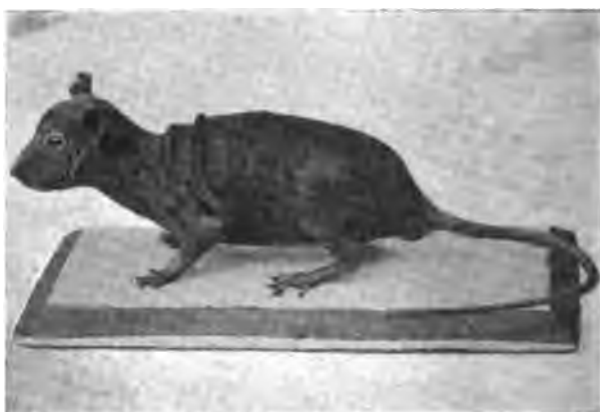
November 10th.—Mr. F. T. Feilden, of Borth, who has most obligingly furnished me with notes for a number of years,

reports having met with a small party of Black Terns at the mouth of the Leri. He writes :—"On February 27th I killed the finest old Heron I ever saw, and as the colour of the legs and bill was very remarkable, I made notes of them before the bird was dead. Bill from base crimson, blending into orange-vermilion, Indian yellow, and aureolin at tip. Eye, scarlet outer circle (iris), straw inside. Legs, upper part vermilion, lower yellow spotted with vermilion. Longest crest-feather, $7\frac{1}{4}$ in.; tip to tip of wing, 5 ft. 1 in.; full length, 39 in. I got a Tufted Duck on September 24th; also a fine drake Merganser, changing from the female plumage. The breast was almost orange in colour, and I took it for a Goosander at first. This colour quite faded in about three days. I narrowly escaped shooting a Peregrine Falcon in mistake for a hen Sparrow-Hawk as it dashed into a flock of Starlings."

NOTES AND QUERIES.

MAMMALIA.

Hairless Rat.—I have recently had in my possession a stuffed specimen of a hairless Rat (*Mus rattus*, male). It was kindly lent to me for inspection by Mr. Ernest Lowe, the Curator of the Plymouth Museum and Art Gallery.*



The Rat was caught alive in October, 1898, in the victualling yard of the Ordnance Store Department at Stonehouse, Devonport. At the time of its capture it was in possession of a few long woolly hairs, besides the whiskers. When the animal was at rest the skin appeared all creased and wrinkled, but in active movements the folds disappeared. The Rat measured 7 in. from the muzzle to the root of the tail, taken along the contour. The tail, which was not perfect, measured $6\frac{3}{8}$ in. in length. The ambit, behind the scapulars, $5\frac{3}{8}$ in. Skin granulated, dirty brown. Hind feet webbed to half length of first phalanx. Tail hairless; scutellæ cycloid, encircling, but somewhat widely separated, and attached all round. Ears also quite nude. The loss of hair is attributable to disease.—T. EDWARD BELCHER (24, Clapham Road).

[For another record of a hairless Rat (*M. decumanus*), cf. 'Zoologist' (1908), p. 454.—ED.]

* Mr. Lowe tells me that the transverse folds of skin across the shoulders are the work of the taxidermist; there were folds, but they were further back, and not transverse.

AVES.

Late Breeding of the Martin (*Chelidon urbica*).—Does not this species regularly continue nesting later than any other British breeding bird? This is my experience, and I see that more than one correspondent (*Zool.* 1908, p. 455, and *ante*, p. 32) calls attention to its late nests. From my own note-book of personal observations I take the following: "Martins feeding young in nest at Wellington, Somerset, Oct. 11th, 1888." The following personal records all refer to Scarborough: "A pair breeding young in nest, Oct. 1st, 1898." "Young in nest, Sept. 18th, 1899." "Feeding young at two nests, Sept. 29th, and at one nest, Sept. 30th, 1900." Of late occurrences of the bird here I have the following notes: "Saw one on Nov. 22nd, 1904, and heard of its being about the same place in December of that year." "Saw one on the South Cliff, Dec. 16th, 1900. One was shot on the North Cliffs, Dec. 23rd, 1900."—W. GYNGELL (Scarborough).

Autumn Song of the Cirl-Bunting and Dipper.—Several articles, including one from Mr. Aplin in 1894, have appeared in 'The Zoologist' on the autumn song of birds, but I have been unable to find the two above-mentioned birds in any of the lists. In this district the Cirl-Bunting (*Emberiza cirlus*) is undoubtedly an autumn songster, and may occasionally be heard singing every year in that season. This Bunting is one of our most persistent singers; the regular song commences about the end of March, and continues to mid-August. I also hear it occasionally every year in September and October. On Oct. 5th and 6th, 1892, I happened to be Salmon-fishing on the Usk, at Glan Usk pool, near one of the haunts of the Cirl-Bunting, and heard the song of this bird at intervals during several hours on each day. On referring to my notes I find I have, in the last fourteen years, heard the song in every month except December, the earliest date being Jan. 25th, 1892, and the latest on Nov. 2nd, 1900—a fine warm day with a shade temperature of sixty-one degrees. Strange to say, I have very rarely heard its much commoner congener, the Yellow Bunting, between the beginning of August and the end of February. The Dipper, which is perhaps as common here as in any part of the kingdom, sings, as is well known, nearly all the year round. I think its song is to be heard on more days in the year than any other bird. It commences singing about the middle of August, and so continues till the end of June. During a hard frost, when all other birds, including the Robin, are without song, the Dipper sings as merrily as in May.—E. A. SWAINSON (Woodside, Brecon).

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A Question of interest in the Life of the Cuckoo.—The Cuckoo (*Cuculus canorus*), whose life is surrounded by so much of mystery, seems to be a perennial source of interest not less to the true bird-lover than to the casual observer. In view of possibly more attention being given to the habits of the Cuckoo during the coming summer, I am about to ask a question, and suggest an answer: Does the bird usually seen accompanying the Cuckoo migrate with it? Until I receive further information on the subject, I reply that it does not. On Aug. 22nd, 1894, I saw the interesting spectacle of a young Cuckoo, fully developed, attended by its foster-mother, a Meadow-Pipit. The "following" in this case was very decided, but I would put that down entirely to the maternal instinct. I can hardly think that a bird whose life is lived on such sober lines as the Meadow-Pipit would follow its foster-child far beyond the bounds of its favourite moorlands. It will rather, I think, give up its child, as other birds do, when the natural period of motherhood ceases. It is even less likely that the Cuckoo's dupe comes with it. This aspect of the question is, I think, hardly worth discussing; but, as throwing a little light upon the whole matter, I may record briefly an incident which came under my own observation on June 16th, 1903. I was spending an afternoon by the shore of the Solway, when my companion and I were attracted by the presence of two Cuckoos, male and female, among the rocks. One (the male) was calling; the other (the female) was attended by another bird, a Rock-Pipit. I have not hitherto seen the Rock-Pipit recorded as a dupe of the Cuckoo, but I am certain of its identity in this case. It was clear that the female Cuckoo was on the outlook for the nest of the Pipit. The latter did not follow closely, but when the Cuckoos arose on the wing it left its stance on a neighbouring rock, and took flight after them. The whole proceedings pointed to the fact that the dupe does not actually associate itself in any permanent way with the Cuckoo, but the Cuckoo, by a kind of hypnotism, secures a temporary influence over the dupe. Indeed, I would be inclined to say that the dupe actually leads the Cuckoo to its nest. If this assumption be proved correct, it fully accounts for the egg of the Cuckoo being, as it frequently is, laid in a nest of which discovery is next to impossible. I should add that I did not find the nest of that Rock-Pipit, but I feel pretty sure that the lady Cuckoo found it before the proceedings closed. J. W. PAYNE (1, Meadow Place, Edinburgh).

Little Owl (*Athene noctua*) and Waxwing (*Ampelis garrulus*) in Lincolnshire.—I have lately seen specimens of these birds, which were shot in this county. The Little Owl (a female) was shot on Jan. 11th

last near Ruskington, Sleaford. It is rather a curious coincidence that two years ago, almost to the day, a bird of this species was obtained about nine miles from the same place (*cf.* Zool. 1902, p. 112). The Waxwing (a male) was shot at Brant Broughton on Jan. 8th. There were six of the wax-like tips on each wing. — F. L. BLATHWAYT (5, Monks Leys Terrace, Lincoln).

Lanner Falcon in Lancashire.—A specimen of the Lanner Falcon (*Falco feldeggii*) was picked up dead on the seashore near Carnforth, Lancashire, on April 26th, 1902. This bird, which is found in the countries bordering the Mediterranean, has never occurred in Great Britain before. The specimen is a female, not quite adult, but almost so. The wing measurement is 14·5 in., that of the male being 18·2 in. It was seen in the district for some weeks, during which time several men tried to shoot it, and eventually it was picked up dead by the owner, and almost warm, having a recent shot-wound beneath the wing. During its residence on the marsh it appeared to live upon small waders. I do not know whether this bird is used in falconry or no, but if any gentleman lost a Lanner Falcon in February or March, 1902, I shall be glad if he will mention the circumstance, so that the bird may not be classed as a truly British occurrence.—H. W. ROBINSON (Lansdowne House, Lancaster).

Great Skua (*Stercorarius catarrhactes*) in the Irish Sea.—It will no doubt interest Mr. P. Ralfe and other ornithologists to hear that on July 20th, 1908, both Mr. E. Williams, of Dublin, and myself had a splendid view of a Great Skua in Holyhead Harbour, not far from the landing-stage. We descried the bird, hotly pursuing a Lesser Black-backed Gull, as we stood on the deck of one of the cross-Channel steamers. This Skua is rarely seen in the Irish Sea, and a visit so close to shipping traffic seems somewhat unusual. Possibly this was the same bird that was taken at Douglas, Isle of Man, on a baited hook later in the season, as recorded by Mr. P. Ralfe (*ante*, p. 88).—C. J. PATTEN (University College, Sheffield).

Birds of Oxfordshire or Buckinghamshire?—I am glad to have been the means of bringing forward a champion for the somewhat neglected ornithology of Buckinghamshire. In recording, as I have for many years, the ornithological occurrences in Oxfordshire, I confess I have always declined to be bound strictly by a purely artificial boundary, especially as no one has of late years taken the trouble to record the occurrence of rare birds in that part of Bucks which adjoins Oxon, or, until recently, those in Berks. In this I had the support and approval

of the late Mr. John Cordeaux, whose opinion on such matters I valued. If I knew exactly on which side of the political boundary the bird occurred, and it was outside our boundary, I said so; but I have seldom taken much trouble to ascertain this, as the question whether a bird fell dead, or was seen, on one side or the other of an artificial boundary line does not seem to me of much importance. It is the usual custom of recorders (not holding a brief for any particular county), when giving the locality of the occurrence of a rare bird, to mention the name of the nearest well-known place. And I entirely dissent on this account from Mr. Cocks's conclusion that the locality "near Reading" (in the case of a water-bird like the Purple Heron) must, in the absence of more precise locality, necessarily assign the bird as belonging to Berkshire. On whichever bank of the river it was killed, a recorder having no interest in championing, ornithologically, either county would give the name of the nearest important place as its locality. The fairer way is to treat the bird as belonging to both counties equally. But if one is to presume, or assume, the presumption is that this Heron would keep to the Oxfordshire bank of the river as much as possible, and as far from the manufacturing town of Reading as possible! I plead guilty to having, by a slip of the pen, written Berks for Bucks in two places. I fear that the fact that I wrote my paper only in the interests of Oxon (and that both Berks and Bucks, so closely interwoven ornithologically in one of the earliest county bird-books, were outside the object of that paper) may have occasioned me to overlook the mistake in the proofs. Woburn I spelt as it is written in the book from which I quoted. I assigned the village to neither Berks nor Bucks, nor did Clark-Kennedy, whose book applied to both. I do not quite understand if Mr. Cocks's remarks (top of p. 85) should apply to the Golden Oriole or the Ring-Ouzel.--O. V. APLIN (Bloxham, Oxon).

BATRACHIA.

Diseases of Salamanders.—About July last I bought two Spotted Salamanders, a male and female. Both appeared to be in perfect health and condition at the time of the purchase, the colours being very bright, and the action of the Salamanders being particularly quick. About three weeks after the purchase, however, I noticed that the colours of the male had become dull and faded, and on investigation I noticed that both its front feet had bad open wounds on them, as if they had been bitten at some time or other. I at once removed the creature from my vivarium, and put it into a smaller one alone. The next morning I found that similar sores had broken out on its tail,

and also that the Salamander had suddenly become deplorably thin. That same afternoon it died. I then proceeded to thoroughly clean my vivarium, and closely examined all my Reptiles and Amphibia, which I found to be in apparently perfect condition. A week later I discovered, to my dismay, that the female Salamander had been affected in the same way as its mate, only not quite so bad. Only the left fore foot showed an open wound. This time I decided to wash the wound with disinfectants and keep it bandaged up. Apparently the wound began to heal, and the colours of the Salamander again became vivid; but as the days slipped on I noticed a decided shrinkage in the proportions of the poor creature, and soon the back legs also began to rot away, and it was not long before my second Salamander was dead. If any of your readers could tell me from what disease my Salamanders suffered, and what might have been the cause of same, I should feel very thankful. All my reptiles are still in the best of health, and never before have I had any serious trouble with any of my Salamanders. I found an ants' nest in the vivarium, and at first put it down to the ants, but I found that they did not like to touch the Salamanders—in fact, they avoided them whenever they could; so evidently the sores were not produced from the effects of the formic acid of the ants.—H. E. MUSSETT (Thornwald, 249, London Road, West Croydon).

[Mr. Boulenger informs me that he has had similar experiences with Salamanders in captivity. The cause of the disease is still obscure.—Ed.]

PISCES.

The Red Snake-Fish (*Cepola rubescens*, Linn.) in Dorset.—Though not precisely a very rare fish, the capture of the Red Snake, or Band-fish, is of sufficiently uncommon occurrence to merit a passing notice. Neither is it a fish that is likely to be overlooked, for its large staring eyes, underhung bull-dog-like mouth, comparatively large head, and thin riband-like body, render it, when gliding through the water in snake-like undulations, by no means an attractive creature. The oldest fisherman had never seen the like, and his daughter declared that it must be a mermaid. Scarcely a compliment, but uttered doubtless through jealousy. *C. rubescens*, so called on account of its bright orange-red hue, is a denizen of the deep sea, coming inshore occasionally in pursuit of the Sprat, and sometimes finding itself enfolded in the meshes of the nets cast for these fish. The present example, not quite twenty-two inches long, was taken in a Sprat-net off the mouth of Poole Harbour, Dorset, in January, and constitutes a new record for that county.—FREDK. PICKARD-CAMBRIDGE (Wimbledon).

OBITUARY.

DR. WILLIAM FRANCIS.

THE death of Dr. Francis, which occurred on the 19th January, will be regretted by all zoologists, to most of whom 'The Annals and Magazine of Natural History' is one of our best known publications. He was born in London on Feb. 16th, 1817; educated for a time at University College School, but chiefly at St. Omer, Cravelt, and Gera, which he left in 1836, and spent a short time at the London University (University College). Thence he went to Berlin, and subsequently to Giessen, where he took his degree of Doctor of Philosophy in 1842.

In 1837 he suggested to Mr. Taylor the establishment of the 'Annals,' which he edited from the commencement, although his name did not appear on the wrapper until January, 1859. He became co-editor of the 'Philosophical Magazine' in 1851, but for a long time previous had taken an active share in its management. In 1842, in conjunction with Henry Croft, he founded the 'Chemical Gazette.'

During his long life Dr. Francis, in his business capacity, printed a vast number of zoological books and publications, was in touch, as editor of the 'Annals and Magazine,' with most zoologists, and proved what the printing press at Red Lion Court could do in the furtherance of biology. In his business establishment it was always a pleasure to see the same old official faces, a criterion of the qualities of both employer and employée, and he may truly be said to have enjoyed the respect of all with whom he was brought in contact. Before his declining years he used annually to entertain a company of entomologists and other zoologists at his Richmond home.

NOTICES OF NEW BOOKS.

Fatigue. By A. Mosso. Translated by MARGARET and W. B. DRUMMOND. Swan Sonnenschein & Co., Ltd.

IN all animal life, in all mental effort, fatigue is a dominant factor ; it affects the brain of the thinker as much as the muscles of the athlete, but is such a familiar phenomenon as to be seldom studied, and usually regarded as a limitation to be received with submission and endured with wisdom. Professor Mosso, of Turin, whose work on " Fear " is already known in the English language, has published a study on animal fatigue, and this book is a translation of the same, of which the author has revised the proof-sheets.

Migratory birds suffer much from fatigue. The Quail, which we read " flies nearly nineteen yards per second, or thirty-eight miles per hour," frequently crosses the Mediterranean in favourable weather without great fatigue, though Brehm has described the arrival of a crowd of them on the north coast of Africa " nearly dead with fatigue." De Filippi has seen Pigeons in the open sea, and in a similar condition, " resting on the waves with outspread wings." Prof. Mosso applies this weariness of the Quail to illustrate a point in the Biblical narrative of Exodus, where the Hebrews are described as fed on Quails in the desert. " The ease with which they let themselves be caught shows how much they were exhausted by their journey." Our author has also experimented on and observed the effects of fatigue on Carrier-Pigeons (long-journey birds). The younger birds arrived at the end of their journey subsequent to the appearance of the older ones, and it " was easily seen that they were very tired, for they alighted on the roof and remained motionless, while the old birds, which had made the same journey, were lively, and kept flying round in great circles and cooing. . . . This shows that their instinct is not of much use to them, if they are not trained."

Some interesting facts are given of the life and career of

Borelli, who wrote 'De Motu Animalium' more than two centuries ago, a work which Mosso considers "modern physiologists should still consult and study." Borelli challenged the then orthodox conception of the will, and was reproached by the Abbé Antonio Rosmini with confusing the sensitive principle with the reasonable soul, and who affirmed that in this doctrine "one may see the origin of modern materialism." Nevertheless, Borelli, the animal physiologist, wrote his book in a monastery, and died in a convent cell; his tomb is in the Church of Saint Pantaleo in Rome, and the inscription ends with the words: "HEIC ADMIRANDUM DE MOTU ANIMALIUM OPUS ABSOLVIT SIMUL CUM VITA."

The larger part of this book is devoted to the mental fatigue frequently experienced by scientific men, though frequently conquered in triumph, as was the case with Darwin, of whom a most generous and competent admiration is expressed throughout the pages. This book is of physiological importance, of great zoological interest, and is worth the perusal of lecturers and teachers.

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No. 753.—March, 1904.

NOTES ON THE BIRDS FOUND ON THE COAST OF SOMERSET.

BY THE REV. F. L. BLATHWAYT, M.A., M.B.O.U.

A WORK on the birds which inhabit the waters and coasts of the Bristol Channel and the estuary of the River Severn, similar to that by the late John Cordeaux, which dealt with the district around the mouth of the Humber, would, I think, be welcomed by ornithologists.

Such a work would be interesting for several reasons. Students of bird migration seem to be agreed that a well-marked line of flight extends across England from the Wash to the mouth of the River Severn. We find, however, in the Bristol Channel, that there are many birds, especially Waders, which seem to be more numerous on the mud-flats around Cardiff and Burnham than they are on the tempting-looking stretches of mud and sand above the Severn Tunnel. This seems to indicate that many species, such as Knots, Grey Plovers, and Turnstones, do not visit the Bristol Channel by the overland route, but come perhaps by way of the shores of the English Channel or the Irish Sea.

If a competent ornithologist were to study the Bristol Channel district as a whole he would perhaps be able to solve many interesting problems with regard to the distribution and migrations of birds in our islands. No such work, as far as I am aware, has yet appeared. In 'The Birds of Devon,' by Messrs. D'Urban

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and Mathew, the authors have given a very comprehensive account of the avifauna of the south-western peninsula of England. This work, however, does not claim to deal with the south coast of Wales, and it seems likely that this coast has an important influence on the migration of birds when passing across central England on their journey to Ireland.

In drawing up the following sketch of the birds to be found on the Somerset coast, it has been my intention to give just a small contribution to our knowledge of the avifauna of the Bristol Channel district. I have rambled at all seasons of the year along the greater part of the Somerset coast-line, and with parts of it, especially in the neighbourhoods of Weston-super-Mare and Burnham, I am very familiar. These notes are chiefly from personal observation made during the last six years with the aid of a pair of prism binoculars, but I have also taken account of notes and correspondence from various friends and capable ornithologists, and have paid some heed to information given by local fishermen and gunners, a class of men who, with a little more knowledge of the various species, could give very valuable help. In the main, then, this sketch may be considered the result of personal field work during those portions of the last six years when I had the opportunity or the leisure to indulge in it.

It seems expedient here to give a general idea of the geography of this coast district. The Somerset coast-line from the mouth of the River Avon at Bristol to Glenthorne, a few miles to the west of Porlock Bay, is some seventy miles in extent, and presents a variety of natural features which affect the distribution of the birds which inhabit it. Beginning in the north, we find the flat land and the mud-reaches at the mouth of the Avon soon giving place to a steep but not very lofty face of cliff from Portishead to Clevedon; thence southwards for four miles, to the rocky headland known as Swallow Point, we find extensive mud-flats bordering a low marshy coast, from which the sea is kept back by artificial embankments. From Swallow Point the coast takes two bold sweeps, forming Sand Bay and Weston Bay, bounded respectively on their southern sides by those outlying spurs of the Mendips known as Worlebury Camp and Brean Down. In each of these bays very extensive mud-flats are laid bare at low tide, the water ebbing to a distance of over a mile, and each

display a fine stretch of sand about high-water mark, the former presenting a line of low sandhills to the advancing tide, the latter, for some two miles of its length, the artificial sea-front of the growing town of Weston-super-Mare.

We have so far passed the muddy estuaries of several streams and rivers flowing into the Channel, the most important being those of the Yeo and Axe. All these during the highest tides are like little inland arms of the sea, filled to overflowing with muddy brown water, but at lowest ebb their appearance is entirely changed. We see then, many feet below us, a tiny stream trickling between deep sloping banks of slimy ooze, in which a man may sink to his knees, or in places even deeper; while down the sides of these banks are little runnels, locally known as "pills," cutting their way deep into the soft muddy slopes.

From Brean Down, a bold promontory, over a mile long and some 320 ft. in height, presenting some fine cliffs on its southern face, the grassy slopes above which are plentifully sprinkled in early summer with the flowers of *Helianthemum polifolium* and *Hippocrepis comosa*, the coast runs south to the junction of the Rivers Brue and Parrett, and then turns westward, forming the curve known as Bridgewater Bay. This forms the seaboard of the great central level of Somerset, and from Brean to Burnham it is faced by a lofty and broad range of sandhills, which keep back the water from the low-lying pastures and moors of the interior. Just south of Burnham the River Brue joins the wide and muddy estuary of the Parrett, and together they wind out into the Channel between the Berrow and Steart Flats, the widest expanses of mud and ooze found on the Somerset coast. Opposite Burnham the combined rivers pass the low-lying Steart Island, and when crossing the bar skirt a bank known as the Gore Sand, which is only covered by the high spring tides. This bay, with its fine stretch of sand and high dunes at Brean and Berrow, its ridges of shingle, extensive mud-flats, and oozy estuaries, and warm shallow waters, bordering, as it does, the large alluvial flats of mid-Somerset, is probably the most interesting bird resort on the whole of the Somerset coast.

From Clevedon to the west end of the Steart mud-flats the coast has, with the exception of the three headlands of Swallow Point, Worlebury, and Brean Down, been flat, sandy, or muddy;

but as we go west we leave behind the large stretches of mud, and find the coast bounded with a line of cliffs—in some places steep and firm, in others sloping and crumbling. We get breaks in this line of cliff at Minehead Warren and Porlock Bay, but on the whole the coast from a few miles east of Quantoxhead to Glenthorne is the steepest and rockiest in the county. At the foot of the cliffs is a beach of large rounded boulders, and at low water there is a certain amount of mud and weed-covered rocks, but the sea does not here retire to any great distance.

As we proceed along the western part of the coast the scenery becomes, from a picturesque point of view, more interesting. The strata of the crumbling and water-worn cliffs attract the attention of the geologist. Little sheltered nooks, gay in spring with primroses and many other flowers, meet the wanderer on the shore as he turns the various low headlands jutting to the north, and in places, such as at St. Audrie's and to the west of Porlock Bay, the slopes are well-wooded almost to the water's edge. The bold outline of the North Hill at Minehead, backed by Dunkery Beacon, and thrusting out its rocky promontory of Hurlstone Point into the sea, is perhaps the most striking feature on this part of the coast. The sea here has lost much of its muddy appearance, and further west, where it is still clearer, many little streams rising in the northern face of Exmoor have in the course of ages cut deep combs through the crumbling cliff, and these, now well-wooded and clad in a wealth of low vegetation and undergrowth, offering a sanctuary to the forest deer, can hardly be surpassed for picturesqueness in any part of the seaboard of the West of England. Behind this West Somerset coast lie the hilly regions of the Quantocks, the Brendon Hills, the high ground around Dunkery Beacon, and the rolling moors of Exmoor Forest.

From the above description the naturalist will see that the coast of Somerset presents a variety of attractive features to the species of birds which haunt the sea-shores. The waters of the bays around Weston are warm and shallow, and are visited in winter by shoals of Sprats. The clearer waters in the west offer a pleasanter feeding ground for those species of birds which find the opaque water higher up the Channel distasteful to them. The cliffs, with their nooks and crannies, the ridges of shingle

and sandy dunes, present attractive breeding quarters ; while the vast mud-flats, oozy estuaries, and firm stretches of sand, bordering, as they often do, low-lying swampy out-marshes and flooded pastures, offer the most tempting feeding grounds to a great variety of coast-frequenting birds.

In dealing with the birds to be found on this coast, I do not propose to give an exhaustive account of all the species which from time to time have been obtained. It is rather my object to give a sketch of those kinds which a field naturalist may expect to meet with when rambling along the shores of Somerset. It is hoped also that the account may be of some interest when compared with those relating to neighbouring counties.

Starting with the order *Passeres*, we find all the commoner Thrushes represented. The wet water-meadows offer them attractive feeding grounds at certain seasons, and Mistle-Thrushes, Redwings, and Fieldfares roam over them in flocks in autumn and winter. The Ring-Ouzel appears regularly in April and September on Brean Down and elsewhere on its way to and from its breeding haunts on Exmoor. The Wheatear finds several suitable nesting quarters, especially among the sandhills at Berrow, and the Stonechat is a common resident wherever it can find the gorse and thick bushes it loves to haunt. The Whinchat, so far as my experience goes, is not often met with near the coast. The Black Redstart often occurs in autumn and winter, and is probably much more regular than the casual observer may think. The Nightingale is not a common bird in Somerset, but I have often heard it singing near the coast, sometimes nearly as far west as Quantoxhead. This bird, I think, is yearly spreading westward. Last year it reached Dunster, and it may soon be expected at Minehead and Porlock.

The families of the Warblers and Titmice can in no sense be called shore-birds, but as in parts of Somerset the trees hang just above the waves, the notes of these birds may often be heard during a ramble along the shore. Thus the Wood Wren is common in summer between Porlock and Glenthorne, and I have heard the Grasshopper-Warbler and the Lesser Whitethroat singing so close to the waves that the bushes they were in must at times be splashed by the spray. The latter bird I have found to be rather common on the Burnham Level, and I have noticed

it nearly as far west as Porlock. The rushy ditches or "rhines" of the Somerset Level, and the ballast-pits by the sides of the Great Western Railway which crosses it, are much frequented by Reed- and Sedge-Warblers. Even the rare Marsh-Warbler, as is now well known, is a frequent summer visitor to parts of the county, especially to the neighbourhoods of Bath, Glastonbury, and Taunton. I feel pretty confident that careful search in suitable spots on the low-lying lands near the coast would be rewarded by the discovery of fresh breeding haunts of this rare species. The nest has on one occasion at least been taken near Clevedon. The Dipper and Grey Wagtail breed plentifully by the clear Trout-streams in the Exmoor district, while the White Wagtail (*M. alba*) occurs in small numbers all along the coast in April and again in autumn, but does not make a long stay. The Rock-Pipit, a characteristic shore-bird, is resident in all suitable localities. I have seen the Red-backed Shrike in summer in widely separated districts near the coast, and the bird is well known in the county, visiting regularly certain favourite haunts year after year; and occasionally the Pied Flycatcher may be seen, chiefly as a passing migrant. This species has, however, quite recently been found nesting near Bristol, and a pair or two probably breed on the wooded banks of some of the streams in the west, where it has been noticed in the summer months.

Parties of Finches and Buntings, sometimes of considerable size, may be seen near the coast in autumn and winter, searching for the seeds of weeds among the sandhills and on the out-marshes. These flocks usually consist of Greenfinches, Chaffinches, Linnets, and Yellowhammers, though Goldfinches and Bramblings are not unfrequently to be met with, and even Twites have occurred. A cold spell of weather is pretty sure to bring in small parties of Snow-Buntings, and I have seen these charming birds and listened to their tinkling notes on the frozen foreshore near Burnham. The Lesser Redpoll has of late years been found breeding rather plentifully in parts of Somerset (*cf.* Zool. 1902, p. 66), but the parties seen in winter prefer the alders by the streams and on the peat-moors to the vicinity of the coast. Siskins also are not uncommon winter visitors to similar haunts. I have found the Cirl-Bunting by no means uncommon in the breeding season near Weston-super-Mare, and

fancy that at that time they prefer the neighbourhood of the sea. In winter they join the parties of other Buntings and Finches. The Reed-Bunting is abundant by some of the "rhines" on the levels, but the Corn-Bunting is rather local, though by no means rare. The Crossbill is only a casual visitor in late summer and autumn. Numbers visited the county in the autumn of 1898, and I saw some on Worlebury Camp, and also rather large parties in the Horner Valley, feeding on the seeds of the mountain-ash, or "quick-beam," as the tree is called in the West Country. The birds were very skilful at extracting these seeds. Some clusters on which I had seen them engaged I afterwards examined, and found the fruit neatly cut down the middle so as to disclose the seeds, but not severed from the stalk.

Starlings, which sometimes appear in the autumn in vast flocks of almost incredible size, nest freely in the sea-cliffs, especially in the west, and numbers of Jackdaws also inhabit these cliffs, where they often place their nests in Rabbit-holes. The Magpie and Jay are common where game-preserving is not too strictly carried on. Many pairs of both species breed on Worlebury Camp, where I have sometimes seen so many Jays together that the assembly might almost be termed a "flock."

The Raven has at least four strongholds at the present time on the coast, but I do not think it advisable to give precise localities. One of these haunts which I know well has been tenanted from time immemorial, and the birds are a source of much pleasure to bird-lovers in the early spring. It is still, I am happy to say, no uncommon sight to see Ravens and also Buzzards in the autumn soaring over the wilds of Exmoor.*

More than thirty years ago the Chough used to breed in the West Somerset cliffs, but I fear that now it is only a very casual visitor, as is also the Hooded Crow. This latter species abounds on the east coast of England in autumn and winter, but it seems that they turn southwards before reaching the western counties. Whatever the reason may be, the bird is very rarely seen in Somerset.

A few Carrion-Crows breed on the sea-cliffs, and many more

* About thirty years ago Ravens seem to have been very common in West Somerset, for, according to an old keeper's record, fifty-two were shot or trapped on Exmoor Forest in a single year.—F. L. B.

inland, where in some localities they are almost abundant. Rooks are very fond of visiting the sea-shore in search of food, and in the autumn and winter large parties of Sky-Larks frequent the out-marshes and the sands, where they seem to find much to their taste among the *débris* washed up by the tides. As far as my own experience goes, the Wood-Lark is a rare bird in Somerset. I have found it in the breeding season near Porlock and Oare, but nowhere else. Doubtless this is a species which is often overlooked.

The Wryneck seems to be a local bird, but not uncommon in some places, while in the woods near the sea the three Woodpeckers and the Nightjar may be found breeding. The Tawny Owl and a few Long-eared Owls also breed in thick plantations, and the Short-eared Owl is found in autumn and winter on the central level. In winter I have often seen the Kingfisher on the sea-coast, and they breed in the banks of some of the "rhines."

In times past the three Harriers bred on Exmoor, and on the Somerset levels, but it is doubtful if any have done so during the last twenty years. It is said that the shepherds on Exmoor used to destroy all the nests they found by stamping upon the eggs! Harriers are still occasionally seen in autumn and winter.

There are still two eyries of the Common Buzzard upon the coast, and a few pairs nest inland in the west. I have seen the young birds in the nest, and have frequently (while riding or walking on Exmoor) watched the old ones soaring overhead, and uttering their plaintive mewling cries. The Kite, once a resident in the west, is now a bird of the past. I have good evidence that a pair nested near the River Barle below Withypool about the year 1850. Only one eyrie of the Peregrine Falcon is known to me within the county boundary, but this is inhabited yearly, and birds of this species are not unfrequently seen on the coast in autumn and winter. The Merlin haunts Exmoor, where possibly a pair or two breed, but the Hobby is only a very rare summer visitor to some of the largest woods. The Kestrel nests on the sea-cliffs, particularly in the west, and during a ramble I have found three pairs in close proximity.

The Cormorant, Shag, and Gannet are chiefly wanderers to the Somerset coast, but the first mentioned bird is not uncommonly seen, and haunts the Steep Holm, an island in the

Channel. A few small heronries are left in the county, and so "Cranes," as the birds are called locally, may often be seen wading about near the muddy estuaries; and Bitterns are occasionally shot on the frozen marshes during hard winters.

The Wild Geese which visit the Bristol Channel district seem to keep chiefly to certain favourite haunts above the Severn Tunnel. Only three species, as a rule, are found—the Bean (which is the first to arrive), the White-fronted, and the Brent Geese. Of these, small numbers of the two former species visit the Brue and Huntspill Levels during hard winters, as well as appearing occasionally on various parts of the coast; while the Brent Goose may sometimes be seen in small parties in the Channel, but never seems to visit the inland marshes. Swans are sometimes seen off Burnham in very severe weather.

At one time the central level of Somerset and Bridgewater Bay must have been a very favourite winter resort for Wild Ducks. About a hundred years ago much of the flat inland district was uncultivated, and liable in winter to very extensive floods, which still occur, but not to the same extent as formerly. This district consisted of some thirteen square miles of marsh and reedy meadows, broken in the centre by the low line of the Polden Hills. It is now about a century since this tract was drained, and with the spread of cultivation the marsh lost much of its former attractiveness for wildfowl. Traces, however, of its former fen aspect still remain, and the ornithologist of to-day may still expect to meet with all sorts of surprises. No less than thirteen duck-decoys have existed here from time to time, and this fact bears eloquent testimony to the former abundance of wildfowl, but at the present time only one, situated on Sedgmoor, is regularly worked, and this with very moderate success. Large numbers of Duck and Teal, however, still occur, a good many of the former and a few of the latter remaining to breed; while Wigeon—once, according to Colonel Montagu, very abundant—occur in very small numbers, with a few Pintails and Shovelers. A pair or two of the last-mentioned species have been known to nest on the peat moor to the north of the Polden Hills. The mud-flats and waters of Bridgewater Bay afford by day a safe refuge for many of these various species, where a strong glass will often reveal them, apparently sleeping, but in reality always on the alert.

The most attractive bird regularly met with on the Somerset coast is the Common Sheld-Duck. Perhaps nowhere in England is it more abundant than on the shores of Bridgewater Bay. There are many localities on the coast where these birds breed, but the largest colonies are on Brean Down, among the sand-hills from Brean to Steart Point, and in the warren at Minehead. Early in the nesting season I have seen one hundred and fifty pairs together on Brean Down, and almost as many on the flats opposite Burnham. The site usually selected for the nest is a Rabbit-burrow, but I have found the eggs in crevices of the face of a cliff, beneath a thick bush, and even in a bed of nettles. In this last situation the eggs could easily be seen from above. The young are usually hatched early in July, and then the various broods seem to congregate, and one may often notice as many as forty downy ducklings on the sea following one pair of old birds. Towards the close of the breeding season and through the autumn this bird gets scarcer on the coast, and during October and November hardly one will be seen. Observers in Wales and on the south coast of England have also noticed this late autumn migration, and it has often puzzled me where the birds go to. Can it be that the birds moult at this season, and so seek a place of refuge on the open sea while incapable of sustained flight, or do they leave the country altogether in search of warmer climes? I do not think the last can be the true explanation, as the birds begin to return early in December, and during the coldest months their numbers in Bridgewater Bay are probably greater than at any other season of the year. On the last day of the year 1903 I counted five hundred in one flock on the Berrow Flats during a spell of cold weather, and smaller parties were feeding at no great distance. In Somerset the species, from its breeding habits, is always called the "Burrow Duck."

From the end of October until the middle of April the shallow bays on the Somerset coast are frequented by flocks of diving Ducks, and during very cold or stormy weather these flocks increase greatly in size. By far the greater number of these Ducks belong to one species—the Scaup Duck—called by the fishermen Diving Curre, or Black Wigeon, and all through the winter months flocks of two hundred or three hundred may be

seen in the bays around Weston-super-Mare. On the day I saw the five hundred Sheld-Ducks, mentioned above, quite seven hundred Scaup and some one hundred and fifty Wild Duck were sheltering with them from a keen wind under the lee of Brean Down. Smaller parties of Scoters, Golden-eyes, Tufted Ducks, and Pochards also occur, and mingle with the flocks of Scaups, but, as far as my experience goes, these four species are by no means common. The three "Mergansers" have from time to time put in an appearance, but must all be considered as rarities.

It has often been stated that the Rock-Dove breeds on the Somerset coast, but I feel sure that the birds noticed were either Pigeons from some farm reverting to a wild state, or that the Stock-Dove was the species seen. A few pairs of this latter bird breed on the cliffs in the west, and its numbers may be expected to increase. The Turtle-Dove and Ring-Dove are common birds in the county, the latter often breeding close to the sea where the woods extend to the coast.

Black Game are plentiful on the heather and whortleberry-clad heights in West Somerset, and I have often noticed the Red-legged Partridge on Brean Down, where a few pairs seem to breed. Quail have frequently nested near Bridgewater, and the Water-Rail, under the name of "Skitty," nests commonly on the peat-moors, where also the Spotted Crake is to be found in winter, and there is strong evidence that some remain to breed. I have never seen the Coot on the coast, but they occur on some inland waters.

As the class of birds known as "The Waders" contains the most interesting of the shore-frequenting species, a few details respecting those which may be found in Somerset may be of interest. Most of the rare species, such as the Wood-Sandpiper and the Dusky Redshank, have occurred accidentally, but it is of more general interest in a sketch of this kind to treat of those species which occur with tolerable regularity. The two commonest birds of this class, without doubt, are the Dunlin and Ringed Plover. These species consort together, and enormous flocks are sometimes seen on the mud-flats. Small parties of Dunlins which are not breeding stay on the coast throughout the summer, but they are most numerous from the middle of August, when the breeding birds begin to return, until the beginning of

May, when the majority leave for northern moorlands. There is no direct evidence that any have nested on Exmoor.

The Ringed Plover, unlike the Dunlin, remains to breed, but its numbers are decidedly augmented in autumn and winter. A good many lay their eggs on the shingle at Steart Island and Steart Point, as well as among the sand-dunes at Berrow and elsewhere along the coast. Several pairs of Oystercatchers also breed in similar haunts, and I have found as many as four nests in a morning in one favourite locality, but not all the birds of this species seen in summer are breeding, and sometimes in June as many as sixty may be seen together. In winter flocks up to two hundred in number may be seen on the Berrow Flats, a feeding ground to which they seem at all seasons to be particularly partial. Flocks of Golden and Grey Plover, sometimes large, occur in autumn, the former seeming to prefer the moors, the latter the mud-flats; some are seen also through the winter, and again in spring on their way to their breeding grounds. A few pairs of Golden Plover perhaps remain to breed on Exmoor, where I have seen small and large parties early in the Stag-hunting season. A few Lapwings lay their eggs on the shingle and among the sand-dunes, but this species always prefers the grassy water-meadows, where in autumn large flocks congregate. Turnstones are sometimes seen on the coast in summer, but their usual times of appearance are autumn and spring. One day late in April I saw a flock of quite one hundred at Steart Point in full breeding plumage.

The Woodcock breeds sparingly in some of the sheltered coverts in the west, and the Snipe breeds both on Exmoor and on the central level, where at times in the winter they are very abundant. They are often flushed from the sandhills by the coast.

The Curlew-Sandpiper and Purple Sandpiper occur sometimes in autumn, the former probably escaping notice among the flocks of Dunlins. The latter prefers a rocky shore, and is not often met with in Somerset. The Knot is an autumn visitor, arriving in September, and I am told that it sometimes visits the Burnham mud-flats in large numbers, though personally I have only seen small parties on the Somerset coast, where I think they only make a very short stay. Sanderlings arrive in small

numbers early in August, and as a rule soon pass on, though I have seen a party of forty in mid-winter. The Common Sandpiper arrives singly or in pairs on the coast about the middle of April, usually frequenting the estuaries of rivers, but they soon leave for their breeding haunts by the Exmoor streams and in Wales. They return to the coast early in August, and sometimes stay until late in October before passing south. The Green Sandpiper is sometimes seen in spring, but is chiefly a visitor in early autumn, keeping rather to the muddy creeks than to the bare flats. A few Bar-tailed Godwits come in autumn, and Redshanks haunt the muddy estuaries throughout the winter, a pair or two perhaps staying to breed.

Numbers of Curlews frequent the mud-flats throughout the year, being less numerous from early spring to late summer, when the breeding birds are away on the moors. Many pairs nest in the Exmoor country. Towards the end of April a few Whimbrel arrive on the coast, and their numbers increase in May, during which month most of the birds pass on, but a few which are not breeding stay throughout the summer, and are joined early in August by arrivals from the north. They seem to leave again for the south during September, but the autumn migration is not, according to my experience, so pronounced as that in spring. Other members of this order of birds, such as the Dotterel, Ruff, Greenshank, Stone-Curlew, Little Stint, and Black-tailed Godwit, are only seen on very rare occasions on the Somerset coast.

The Bristol Channel is not much frequented by the Tern family, but the Arctic, Common, Little, and Black Terns are occasional spring and autumn visitors, though the naturalist on the shore will not often meet with them.

Gulls are far more numerous, among which the rare Sabine's Gull has frequently been shot in September, usually in immature plumage, and other rare species are from time to time obtained. Among the species which may regularly be seen, the commonest by far is the Black-headed Gull. Young and old arrive on the coast early in July, and from that time until the middle of March they may be seen in flocks up to four hundred or more on the mud-flats, and at the mouths of rivers. They leave very early for their nesting haunts, but a few non-breeders and young linger on through the summer.

Numbers of Kittiwakes sometimes come into the bays in winter following the shoals of Sprats, but I have not found this species so numerous on the Somerset shores as the Common Gull, which appears in large flocks early in August, and is much later in starting for its breeding haunts in spring than the Black-headed Gull, not leaving until the end of April.

About twenty-five pairs of Herring and Lesser Black-backed Gulls breed together at the present time on the north face of Steep Holm, an island in the Channel included in the parish of Brean, and among them two or three pairs of Kittiwakes nest. There are no Gulls breeding on the mainland sea-cliffs of Somerset at the present day, but a colony of Herring-Gulls nest on the Lynton Foreland, only three miles beyond the western boundary of the county. The larger Gulls are not numerous at any time upon the coast, the Greater Black-backed Gull being only seen occasionally, either singly or in pairs.

Razorbills, Guillemots, and Puffins are frequently found dead on the Somerset coast after gales, but they are rarely seen alive, as they keep well out in the Channel, and sometimes visit the Sprat-nets around the Holms. The two first mentioned seem to have nested formerly on Steep Holm, and boatmen have shown me places on the island where the "Murre," as they call them, used to breed. This rock was once a great resort for sea-fowl, and I am told their eggs were taken to Bristol and made use of at sugar refineries. An old resident at Weston-super-Mare remembers Kittiwakes breeding there "in innumerable numbers" less than thirty years ago, but this is certainly not the case now. Perhaps the erection of the batteries on the island some thirty-six years ago, and the consequent need of resident gunners, had something to do with banishing the breeding sea-fowl. The *Alcidæ* which now find their way up the Channel doubtless come from Lundy or the South Wales breeding stations. Divers and Grebes are rare on the Somerset coasts, probably finding the water too opaque and muddy to suit their fishing habits, and the Skuas, Shearwaters, and Petrels which are occasionally noticed may be considered as wanderers from more distant haunts, or accidental visitors blown into the Channel by adverse gales. It seems strange that the Manx Shearwater, which breeds in large numbers in the Scilly Islands, and on

Skomer, off Pembrokeshire, has only been noticed on very rare occasions off the coast of Somerset.

This paper on the birds inhabiting the seaboard of Somerset, as already stated, is not intended to deal fully with all the species found in that district, and several kinds of land-birds have been omitted. When treating, however, of the essentially shore-birds, such as Ducks, Gulls, and Waders, particular care has been taken to note their times of arrival and departure, and the length of their stay. It is not improbable that if more continued observation had been possible these dates would have required some modification. I have, however, kept careful records of the movements of birds on this coast for the last six years, and so it is to be hoped that a fair amount of accuracy has been obtained. If any reader acquainted with this district is able to throw light on some of the doubtful points mentioned in this sketch, or to add further interesting particulars, I shall be very pleased to receive communications on the subject.

ON THE NESTING HABITS OF THE COMMON BUZZARD.

BY Professor J. H. SALTER, University College, Aberystwith.

WHILE the term "common," as applied to the present species, merely serves to recall the fact of its having formerly been probably the most familiar and widely distributed of the larger birds of prey, there are certain districts where the epithet is still merited. Such are certain parts of Wales where, over a wide stretch of country, the Buzzard still exists in fair numbers, and seems likely to hold its own for many years to come. Banished to a large extent from the game-preserving districts, it finds a stronghold amongst the rocky dales which intersect the upland sheep-walks. There are many such where, except for the whistle of a chance shepherd or the barking of his dogs, the mewing of the Buzzard is the only sound which breaks the stillness. In at least one such locality, owing to protection, the "Boda" (to give the bird its common Welsh name) has decidedly increased in numbers within the past twenty years. Here the only danger which threatens it is the greed of the egg-collector, with his offer for "British-taken clutches" of a price which leads certain dealers to raid the whole district annually. In coming years it will be increasingly rare for a naturalist to have the opportunity once enjoyed by the writer of watching the Raven, Kite and Buzzard upon the wing at the same time.

The flight of the Buzzard lends to the bird a dignity scarcely borne out by its true character. We may chance, in rounding some rocky buttress, to surprise one at close quarters. As it wheels overhead we can see the yellow cere, watch every motion of its head, and even note the expression of its eye. But a few flaps carry it half-way across the valley. Then, joined meanwhile by another, it soars. The wings are thrown upward till they appear nearly vertical, and the bird mounts in a series of grand spiral curves. Now, as it turns, the sun glances upon the light

under side of its wings. Higher it goes, till lost against the blue, then coming into sight again against the white cloud-masses which herald the coming shower. The whole of this aerial evolution is directed by slight movements of the tail rather than by any appreciable motion of the wings. At other times the bird presents an entirely different outline as it crosses the valley, flying fast and low, with wings incompletely expanded, *i. e.* bent at the carpal joint. Or, partially closing its wings in this way, it will fall rapidly, almost in the style of the Raven. Occasionally the Buzzard hovers like a giant Kestrel, but the mechanism appears to be different, as there is not the tremulous movement of the wings, the downward glide and quick recovery observable in the case of the latter bird. An old shepherd, seeing a Buzzard hang in this way against the wind, remarked that it was a sign of foul weather to come, and, sure enough, a notable storm of wind and rain shortly followed.

Early in the day, the Buzzard may be seen working in a business-like way along the rocky slopes, alighting frequently, and evidently making its morning meal. In close damp weather it will remain listlessly perched for hours, but, if the evening be fine, always soars towards sunset. A bold craggy hill at the meeting-point of two valleys is a favourite rendezvous and place of call for all the large birds of the district. Here half a dozen Buzzards may be seen thus disporting themselves, as if to catch the last rays of light. The birds are late abroad, and sometimes come overhead, shadowy and Owl-like in the dusk.

The staple food of the Buzzard—at any rate, upon the sheep-walks—is probably furnished by dung-beetles of the genus *Geotrupes*. It is not averse to carrion, and joins the Raven at the feast when a sheep has perished in the March snowdrifts. One was seen carrying off with some difficulty a dead lamb of perhaps three days old; its mate flew round it excitedly. A friend of the writer's watched a Buzzard rise from the hillside above Barmouth with a snake writhing in its claws. It has been seen to catch a wounded Partridge, and is partial to Moles. It was observed that a pair of Buzzards completely cleared off the latter from the fields below the rock which they had selected as a nesting-site. The nature of the food supplied to the young birds will be referred to later.

As early as the middle of March the Buzzard selects a nesting-site, or more usually begins to repair one of its nests of a previous year. Thus, on March 17th, Mr. Grubb tells me that in a bright interval between snow-showers he watched a Buzzard carrying a large stick to its nest, though the frost had been so sharp the previous night that the little river was frozen half-way across. In addition to its favourite and most usual site, each old pair has at least one alternative nest. They will often repair both, even so far as to put in lining, finally deserting the two in favour of a fresh choice. Snow in early April sometimes hinders building operations, and comparison of a number of dates shows that egg-laying does not ordinarily begin till the third week of that month; eggs may be found by April 18th, but seldom earlier. By May 15th, if all goes well, the nest contains newly-hatched young, and just a month later these are ready to leave the nest. Some birds are evidently later in breeding than others, but fresh eggs found towards the close of May evidently represent a second attempt, due to the first eggs having been taken.

Evidence favours the view that the Buzzard is not naturally a rock-breeder. It does not select the bare precipitous cliff which often furnishes the Raven with a nesting-site. The sides of the narrow dale are marked by broken outcrops of the grey Silurian rock, over which the sheep everywhere make their way amongst the bilberry and heather to reach the scanty grass upon the ledges. Ivy mantles a part of the rock-face; birch, rowan, and holly find roothold in the crevices. There is seldom a sheer fall of more than twenty feet. Upon one of the ledges, behind and supported by a small tree which springs from the rock, is the big pile of sticks which serves the Buzzard as a nest. Nine out of ten such nesting-sites can be reached without a rope with perfect ease. I have seen the nest upon steep screes supported by a shrub of birch with scarcely anything of a fall below it, and Mr. Grubb writes of a similar nest upon a bare scree far from any rock, resting upon a tiny hawthorn-bush. A nest tenanted by Buzzards one season is sometimes found to be occupied the next year by a pair of Ravens. If both are absent, Kestrels probably take possession. Mr. Grubb found a Kestrel thus sitting upon two Buzzards' eggs and three of her own. In one

instance Raven, Buzzard, and Kestrel successively occupied the same nest the same spring, but in each instance the eggs were taken. In nesting the Raven is said to prefer a western aspect, while the Buzzard avoids the west, disliking exposure to wet winds ; but the Raven chooses a deep niche, well overhung, and thus obtains shelter.

Even where there is an unlimited choice of nesting-sites upon wooded rocks, a tree is sometimes selected. Oak is the natural growth of these valleys, though little is left except in isolated spots, chiefly in rocky and inaccessible gulleys. When an oak is chosen it is noticeable that the Buzzard selects a side branch, while the Kite prefers the main fork from which the larger branches diverge. A first year's nest is small and compact, often founded upon the substructure of an old Crow's or Magpie's. In several cases the Buzzard has taken to nests built and formerly occupied by the Kite. One such was for a single season in possession of Ravens ; the Kites are gone, and the Buzzards are now in undisputed possession of the huge structure. I once found a presumably young and inexperienced pair building a nest of easiest access in a small sycamore close to a ruined sheep-fold. Nearer to the low country where the valleys alter in character and become less rocky, the Buzzard becomes ordinarily a tree-builder. Where larch-plantations prevail, as upon the Cardiganshire side of the mountains, that tree is often selected, sometimes a Scotch fir, or occasionally a spruce. The trees are not of tall growth, and the nest is commonly not more than 25 to 30 ft. from the ground.

For nest-building purposes, the Buzzard selects sticks of smaller diameter than those which are chosen by the Raven. Built up by annual additions, the pile often becomes three feet across, and of nearly the same height. But sometimes, when placed upon a ledge, the nest is little more than a hollow formed by flattening down the heather and bilberry. Mr. Grubb mentions a nest of this description as consisting of not more than half a dozen sticks, so that the one young bird rested upon the bare ground. In another instance the whole ledge, nearly a yard wide, was a nest-platform, littered with bits of stick, sedge, and dry grass, while in the middle, in just the slightest grass-lined hollow, lay the two eggs. The lining ordinarily consists of finer

twigs, upon which are placed dead leaves, tufts of *Luzula sylvatica*, or of the small *Scirpus* torn up by the roots, or dry stalks and fronds of the brake-fern. A well-known characteristic of the Buzzard is its habit of decking the nest with fresh-pulled leafy twigs, often of the birch or rowan. These are renewed from time to time as the young grow. A nest examined last April was most artistically finished with a lining of fresh green sprays of leafing larch, sprigs of Scotch fir, ivy-leaves, and pieces of bracken frond.

The Buzzard is never seen to such advantage as when disturbed by our intrusion in the neighbourhood of its nest. Its flight then becomes more active and graceful, its whole bearing more animated. Probably the male bird is first seen soaring above the rocks, wheeling round with angry gestures and indignant mewing cry. Suddenly he swoops and skims at full speed past the crag where the nest is situated. Leaving her eggs, the hen bird joins him, and as we climb both circle overhead, mewing piercingly and persistently. There are well-recorded instances where something very nearly resembling an attack has been made, but nothing of the kind has ever occurred within the writer's personal experience. Sometimes in the case of a pair one may note a considerable difference in plumage, one having the whole of the breast dark, while the other is largely ash-coloured.

If incubating, the hen bird sits close, and leaves her eggs with reluctance. A friend writes of his first Buzzard's nest: "It was not till I got to the top of the cliff and saw her sitting on her eggs within twenty yards of me that she deigned to fly off." Mr. Grubb knew of a nest situated close to the top of a small cliff. He says: "Approaching from behind, I looked over the edge, and found the old bird within about two feet of my face. She was evidently a little uneasy, and was standing up in the nest, peering over the edge. When she caught sight of me there was a fine commotion!"

When the Raven and Buzzard are nesting in close proximity they appear to spend half their time in harmless skirmishing. The cock Raven makes angry sallies to drive off the Buzzards whenever they approach his domain. The Buzzard, rising lightly, swerves to avoid the downward rush of his sable foe.

Kestrels, Jackdaws, and Carrion-Crows join in the tournament, and some graceful aerial tactics may be witnessed.

The eggs laid by the Welsh Buzzards are said to be large as compared with specimens from the Continent. Three is the most frequent number, but clutches of two are extremely common: and I have known a bird, which from its light bleached appearance was probably very old, to lay one egg only for several years in succession. Clutches of four occur, but are most exceptional. The eggs as a rule are not well marked. Where three in number, one will probably be blotched and clouded with red, one slightly marked, the third almost colourless, but quite commonly all three are of the last-named type. In one case, however, all three eggs were exceptionally well marked. It is usually said that it is impossible to distinguish eggs of the Common Buzzard from those of the Kite. The few Welsh Kites' eggs which I have had the opportunity of examining differed from Buzzards' eggs in being somewhat larger, very slightly pointed at one end, and of a more bluish-white ground colour.

The young Buzzards are covered with straight greyish down, whiter on the front of the neck and breast. The eyes are black, the cere is yellow, and the rest of the beak black. They have a feeble piping note, which may be heard before the young bird is freed from the shell. Incubation appears to commence as soon as the first egg is laid. The young are consequently hatched at intervals of one or perhaps two days. The nestling which is first hatched is naturally the strongest, and the result is frequently a family tragedy. It appears to be quite the usual thing for the first-born to kill one if not both of his younger brothers. I first became aware of this habit ten years ago while examining a brood of three young Buzzards. One of them, fierce as an eaglet, struck at my finger, and at a Shrew which I held to him, then caught one of his fellow-nestlings by the nape of the neck, and pecked and worried him with all his might. Again, referring to two newly-hatched young, I have a note: "The stronger one bullied the other one unmercifully, and was evidently in process of doing it to death." Mr. Grubb writes of a nest which "had three young when I first saw it, but one was rapidly bullying the others to death. A week later this one—the biggest of the three—had finished his brothers, and grown proportionately." As

confirming this curious feature of the Buzzard's domestic economy, a good observer remarked to me that, while three eggs are frequently laid, the bird never brings off three young. This appears to be the case in the hills, but in the lower and more fertile valleys, where food is abundant, I have known several instances in which three young were reared.

A flat rock in the neighbourhood of the nest is selected as a dining-table, and is usually strewn with feathers, castings, and perhaps the remains of a small lamb. The young call vociferously for food long after they have left the nest. The old birds bring Mice and Field-Voles, young Rabbits, and an occasional Leveret; also Moles, and such few birds as they can catch. The ardent bird protectionists who assert that the Buzzard never takes young game-birds have probably never had a hungry brood under observation. When beating over the moor a Grouse cheeper is sometimes caught up, and in the lower woodland districts a young Pheasant is now and again surprised in the neighbourhood of the coops. But in the wilder hill-districts the Buzzard must be looked upon as being absolutely harmless, since Grouse are rare upon the sheep-walks, and Pheasants non-existent. More good would probably be done by trying to induce landowners and game-preservers to share the view that the presence of this fine bird lends an element of interest and beauty to the wild scenes which it frequents, than by making in its favour random statements which any gamekeeper who knows the habits of the Buzzard when it has young to provide for will at once dispute.

ROUGH NOTES ON DERBYSHIRE ORNITHOLOGY, 1902-1908.

BY THE REV. FRANCIS C. R. JOURDAIN, M.A., M.B.O.U.

1902.

THESE notes are continued from 'The Zoologist,' 1902, p. 459.

Mr. W. H. Walton informed me that he saw a male Merlin, recently killed, exposed on a keeper's gallows at Howden on June 21st, which looks as if these birds had again attempted to breed on the moors. A pair of Nightingales also bred this spring near Ockbrook (W. H. Walton).

A white Rook was haunting the Egginton district, and many attempts had already been made on Oct. 6th to shoot the unfortunate bird, which was still able to rise from the ground in spite of a broken leg (G. Pullen). A Badger was picked up on the Great Northern line near Egginton, which had been killed by a passing train, and others were seen near the Fox-covert (*id.*). While looking at a young Pheasant in my garden on Nov. 6th, I was astonished to see a second bird take wing from one of the chimneys where it was perched, followed by a third from the lawn! This is the only time I have ever seen a Pheasant perch on a building. During the floods in the Dove Valley at the end of November many Dippers were to be seen flying high in the direction of the tributary streams. These winter floods always seem to drive the Dippers from the river, although at other times they are strictly sedentary.

1908.

January 17th.—Flocks of Siskins feeding on the alders at Calwich. On the 26th A. S. Hutchinson received a fine Brent, a solitary bird which had been driven inland by the storms of mid-January. It was shot on the river near Rocester, and is the only definite occurrence of this species in the county for seventeen years past. A male Ruff was sent in for preservation from the

sewage-farm on Feb. 3rd, where two or three others were seen with it; and Hutchinson informed me that there were three birds when he shot the male, now in the Rolleston Hall collection, on the same ground on March 1st, 1897. It is difficult to believe that these birds, if unmolested, would not breed in the neighbourhood.

March 18th.—The first Wild Duck's egg reported to-day from Repton, while the Chiffchaff arrived on the 22nd, and was singing briskly at 8 a.m. next morning. The smart shock of earthquake felt here on the 24th did not appear to produce any alarm among the birds which were singing at the time. On the 29th an Egyptian Goose was seen on Yeldersley Pond, and remained there for some time. On April 2nd, after some search, I found a pair of Herons breeding in a big Scotch fir standing in a small plantation near Longford. The remains of an old nest were visible in the same tree. About this time some men who were building a cart-shed at Osmaston found a Badger inside it when they arrived at their work in the morning, and managed to secure it. It was carefully locked up in an outhouse, and its capture duly recorded in the local paper, but next morning the Badger had disappeared, having effected its escape in the night!

While returning to Clifton with some friends on the evening of April 10th, we noticed a Lapwing get up from a field ahead of us, but another Lapwing which was flying about immediately stooped at it, and drove it to the ground. A second attempt to rise was defeated in the same way. As we got nearer the aggressor flew away, and presently we saw the crouching bird get up, but it had barely travelled thirty yards before a Sparrow-Hawk dropped on to it like a flash from an ash-tree (where it must have been all the time), and seized the Lapwing by the head. For several seconds a violent struggle in the air ensued, during which time the Lapwing continued to scream loudly, but at last the Hawk failed to make good its hold, and the Lapwing broke away and flew off heavily. I have frequently picked up the remains of dead Lapwings on their breeding grounds, which were in all probability killed by Sparrow-Hawks, and I have seen the sternum on an old nest used as a "dining-table," but never actually saw one struck by a Sparrow-Hawk till to-day.

Early in May one of the keepers at Farley, Staffordshire,

came across a Woodcock's nest with three recently hatched young. Three nests of the Grasshopper-Warbler were found this year at Repton—the first, with five eggs, on May 22nd; the second, with six eggs, among coarse vegetation on low ground on June 2nd; and the third, which only contained three eggs, on June 10th. There seems to be much variety in the nesting-sites used by Sandpipers in this district. I have already mentioned (Zool. 1900, p. 431) a nest among grass by the side of the North Staffordshire Railway, only eight feet from the metals. This year a nest was found at Osmaston, right in the middle of a wheat-field, some forty yards from the hedge, and nearly a quarter of a mile away from water. A third, photographed by Mr. R. B. Lodge in 'Pictures of Bird Life,' p. 363, was well sheltered by tall burdocks close to the edge of the River Dove, while a fourth was a hollow on the side of a steep little bank, and was approached by a long run.

On May 27th a pair of Great Spotted Woodpeckers had just finished cutting out an entirely new nesting-hole in a dead stump standing in the Ramsor Woods, but they were promptly dispossessed by a pair of Starlings, apparently the same birds which had already reared one brood from an old Woodpeckers' hole not far away. Although I removed the Starling's nest, the Woodpeckers would not return to their hole, but took possession of an old boring in another dead tree quite forty feet from the ground, and succeeded in bringing off their brood without further molestation. Not far from these woods Mr. Lodge and I came across a fine Grass-Snake, only an inch short of three feet long, on June 2nd. These reptiles are by no means common in the Dove Valley.

On June 8th I visited the Swift colony at Ashburne, and at once saw that something was wrong. There were hardly any birds about, and on examination I found that there were dead Swifts in nearly every nest-hole. Altogether from seven nests I took out eleven dead Swifts, which had evidently been there for some time, as they were much eaten by maggots. Two of the nesting-holes appeared to be still occupied, but there were no eggs, and only four birds were to be seen in the vicinity. Presumably the very cold and inclement weather of May and the consequent dearth of insect-life had caused this wholesale

destruction, and possibly there may be some connection between it and the late stay of the Swifts reported from many parts of England. I had no opportunity of examining the nests again later in the year, but was told that this breeding-place was afterwards entirely deserted by the Swifts, although for more than thirty years past every available hole had always been occupied. On the evening of the same day I found a Moorhen's nest in a quickset hedge, about 3 ft. 6 in. from the ground, which contained a single young bird in a moribund state, apparently deserted by its parents. The fields in the neighbourhood are subject to floods, and I have frequently flushed Moorhens from the tops of a number of spruce-firs thirty or forty feet high in an adjacent plantation, and am inclined to believe that an empty nest which I once found in one of these firs belonged to this species. Another bird which I have never before found nesting in a hedge is the Pied Wagtail; yet on June 14th I found a large, substantial nest of this bird in a rather slight bit of hedge close to the roadside. The hen was sitting on the nest, which contained five slightly incubated eggs. One of the keepers at Osmaston showed me a Blackbird's nest in mowing-grass at some considerable distance from any hedgerow or bush. It contained young birds on June 23rd, and my informant assured me that he had noticed two or three nests this year in similar places.

There were probably about seven couple of Tufted Ducks breeding on the ponds at Osmaston this year, and perhaps three more at Yeldersley. Mr. W. Boulsover tells me that this year they bred at a pond in Hassop Park, and most likely at Ashford Lake as well, as five or six birds were seen there throughout the summer.

Under date of July 15th, Mr. H. G. Tomlinson writes that "the young are just hatching in a Willow-Wren's nest in a holly-bush five feet from the ground" at Burton. Curiously enough, the Wild Duck furnishes the last as well as the first item in my egg-journal for 1903, for on Oct. 2nd Mr. W. H. Walton found one sitting on thirteen eggs near Monk's Pool, Breadsall.

Mr. A. S. Hutchinson informs me that among the birds which passed through his hands were a "lemon-coloured Chiffchaff and a white Willow-Wren."

The persistently dull and wet weather which was characteristic

of the summer and autumn of 1903 seemed to have the effect of putting a stop to the usual outburst of autumn song on the part of the Chiffchaff, and I have only notes of having heard it between Sept. 20th and 25th.

Mr. G. Pullen kindly drew my attention to a hitherto unrecorded specimen of Sabine's Gull (*Xema sabinii*), which has been in the museum at Derby since 1894, in which year it was shot at Chaddesden about Aug. 26th. It is a young bird with the black-bordered tail of immaturity. This is the first instance of the occurrence of this bird in Derbyshire.

F. B. Whitlock, in 1898, estimated the total number of species which have occurred in the county at 241, but in this number he included five species which have never been allowed a place on the British list, *viz.* the Red-eyed Flycatcher (*Vireo olivaceus*), the White-bellied Swallow (*Tachycineta bicolor*), the Canada Goose (*Bernicla canadensis*), the Egyptian Goose (*Chenalopex ægyptiaca*), and the Summer Duck (*Aex sponsa*). Seven other species were included on insufficient and in some cases quite erroneous evidence, thus reducing the number of definitely recorded species to 229; but more recent evidence enables us to restore one of them—the Blue-headed Wagtail (*Motacilla flava*)—to the list, while four new ones have been added, *viz.* Montagu's Harrier (*Circus cineraceus*), the Night Heron (*Nycticorax griseus*), Sabine's Gull (*Xema sabinii*), and the Black-throated Diver (*Colymbus arcticus*); so that we have now reasonable proof of the occurrence of 234 species within our limits.

THE GESTATION OF THE BADGER.

BY ALFRED HENEAGE COCKS, M.A.

MR. JAMES PATERSON'S experience, as related by Mr. C. Cook (*ante*, p. 30), forms a new link in the curiously twisted chain of evidence on this puzzling question. I therefore wrote to Mr. Paterson, requesting further particulars, and he has very kindly sent me the following full and interesting account of his experiences (here very slightly abridged in a few places from the original).

I have also hunted up every scrap of information my own small library furnished relative to the breeding of this species, with the result that I have been led to what is certainly a surprising conclusion as to the gestation; and, as it is an entirely new one to me, it assuredly is not the product of any theory unconsciously held. Whether it will meet with general acceptance remains to be seen.

Mr. Paterson writes:—"My first Badger to be kept in confinement was a female, caught by my son on Jan. 15th, 1897. Noticing a newly-wrought earth on a lone hillside, where bundles of rough bracken and fern were so arranged about the entrance as almost to conceal it, his curiosity was aroused; so, digging the place, he secured its solitary occupant, and brought her home. On Feb. 27th following she gave birth to three cubs, of which one (a female) was successfully reared. On Nov. 25th I secured a male. The following spring and summer, *i. e.* 1898, were times of diligent watchfulness after sundown, for it would appear that no amount of captivity will change a Badger from its nocturnal ways. At last I had my reward, as on July 10th an attempt to mate with the old female was noted; and this was followed two nights later by an undoubted pairing. My vigilance after this somewhat relaxed, and nothing further of importance was seen.

"On Feb. 13th, 1899, going into the kennel, I saw something was wrong by the way the old female sprung out of a corner, and found a young one there, dead. Judging from its appearance in comparison to the young of the previous year, I concluded that another three weeks or perhaps a month would have been required to have brought it to maturity.

"From this, partially corroborated by subsequent events, do I ground my belief in the eight months' gestation.

"A few days before this occurred I had been making some interior alterations, so as to separate the male from the females, and the unusual disturbance probably caused the mishap.

"The spring and summer were again times of special care, particularly July; no successful pairing, but only attempts were this time noted, and these were in the month mentioned. However, on Feb. 27th, 1900, the young female gave birth to a pair, she being on that day three years old. On March 8th the old female also gave birth to a pair, but one of these was dead. I may here say my old female became paralysed shortly after this, losing all power in back and hind-quarters; but otherwise she appeared healthy enough, and nursed her young, or, more properly speaking, 'conjointly' nursed *the* young. During the summer months first one dam and then the other might be seen nursing all three cubs together, and no quarrel occurring. This was an interesting period, and the docility displayed by the old male towards the teasing youngsters was both amusing and surprising.

"The state of the old female precluded all hope of further breeding from her, and my ensuing summer's observations were but a repetition of the previous July, but in regard to the young female only.

"Feb. 21st, 1901, saw another pair of cubs bred from the latter, and this is the last litter from which I have reared young.

"Brought up in a district where Badgers are pretty numerous, I had, before keeping specimens in captivity, questioned myself how it could be possible that the young should so regularly appear every May or June, if the gestation period exceeded twelve months.

"Any person first seeing a Badger at birth would naturally conclude that it was born much before time. All mine were completely nude, and for six weeks blind. I also hold to the idea that for some time after birth the whole support they get, or seek to receive, lies in the warmth only of the dam.

"Your idea as to the probable age of the cubs whose measurements you give in 'The Zoologist,' corresponds with my own. Mine were all remarkably slow of growth the first two months, but amazingly fast the following three.

"Your experience of April 27th, when your keeper reported something wrong, was also mine on two occasions with my first lot, though not quite so fatal. We all know how easily a Fox is made to remove her young to other quarters when disturbed. A kindred feeling, I believe, pervades the Badger, and, finding this impossible when in confinement, gives rise to the excitement which only those who have kept them can understand; hence the disaster.

"My kennel at present consists of four—one male and three females—the surviving produce of the last three litters. They are now kept more as pets than for purposes of observation."

Mr. Paterson's suggested reason for the fatality to my cubs (as mentioned, Zool. 1908, p. 448) is a very likely one, though I am still inclined to think my own explanation the right one. In breeding other wild animals (Wild Cats, Martens, Otters, Polecats, &c.), I have always been careful to provide an alternative bed-box, of which I know well the necessity, and it was certainly a careless omission not to have done so in this instance. I cannot, however, agree with Mr. Paterson in his belief that young Badgers do not suckle for some time after birth, though the result, it must be remembered, of considerable experience.*

An analysis of Mr. Paterson's experiences (calling his original female No. 1, and the young female born from No. 1 in 1898, No. 2) shows:—

1897.—Jan. 15th, No. 1 caught; Feb. 27th, she produced three cubs (only one, the female No. 2, reared). Nov. 25th, male caught.

1898.—Pairing observed July 10th, and especially "two nights later" = ? July 12th.

1899.—Feb. 18th, No. 1 had one cub, dead, and supposed to be premature by three weeks or a month; or conjectured natural date for birth between about March 5th and 12th. Attempts at pairing observed in July.

1900.—Feb. 27th, No. 2 had two cubs; March 8th, No. 1 had two cubs. Attempts at pairing with No. 2 seen in July.

1901.—Feb. 21st, No. 2 had two cubs.

* Gallinaceous birds, or some species of them, eat nothing for four-and-twenty hours after leaving the egg, but with young mammals, on the contrary, their very first action—I should have said invariably—is to find out how to obtain a meal. Whether, however, the non-requirement of nourishment be real or only apparent, the note tends to show the somewhat embryonic condition of the cubs.

The following synopsis shows all the scraps of evidence I know of bearing on the gestation of the Badger; most of the instances are to be found in the pages of 'The Zoologist.' Some of them were originally published in the 'Field,' next quoted in 'The Zoologist,' 1864, p. 9219, *et seq.*;* and again quoted in 'The Zoologist,' 1888, p. 12, &c., by Mr. Harting, in quite the best account ever published of this species. Mr. G. W. Duff Assheton Smith has sent me word of another case which occurred in his collection, in which a female Badger purchased in Spain in 1891, and brought home on his yacht, "had young after being in a cage by herself for fifteen months from the time she was captured."

Reference.	Date of Pairing or Commencement of Solitary Captivity.	Young Born.	Gestation, or Minimum Period.
1. Meade-Waldo, Zool. 1894, 221	Pair born (about Feb.) 1880, and paired in Oct. ?	Middle of March, 1881	Gestation ? circa 5 months
2. J. Paterson, <i>supra</i>	Paired (10 &) 12 July, 1898	Feb. 13, 1899	Gestation 7 months, supposed premature, and should have been circa 8 months
3. J. Paterson. <i>supra</i>	Paired ? July, 1899	Feb. 27, 1900	{ Gestation apparently from 7½ to nearly 8 months Gestation apparently between 7 and 7½ months
4. Do.	Do. ? do. do.	March 8, 1900	
5. Do.	Do. ? do. 1900	Feb. 21, 1901	
6. 'Field,' July 9, 1864; Zool. 1888, 12	Dug out in April, contained	died in June, and } fetuses	At least 9 months
7. Bell Hotel, Worcester; Zool. 1888, 12	—	—	At least full 10 months
8. 'Field,' Dec. 20, 1856; Zool. 1888, 12	—	—	Shut up 46 weeks 5 days = at least over 10½ months
9. 'Land and Water,' Dec. 12, 1868	—	—	At least 11 months
10. Haughton Hall, Salop, Zool. 1888, 12	Obtained before April 3, 1860	March 12, 1861	At least 11 months 9 days
11. Salvin, Zool. 1877, 251	[Apparently paired March 5, 1876]	Feb. 16, 1877	Gestation, a year all but about 17 days
12. Zoological Gardens, presented by J. E. Liardet	Received March 20, 1876	March 14, 1877	At least a year all but 6 days
13. Assheton Smith, Zool. 1908, 442	—	Early in March, 1908	At least about 12 months
14. Corbin, Zool. 1877, 251	—	—	At least a year or more
15. F. Allies, Worcester, Zool. 1888, 12	—	—	At least more than 12 months
16. F. Heycock, Bedford, Zool. 1888, 12	—	—	At least 13 months
17. Hull Zoological Garden, Zool. 1888, 13	—	—	At least 15 months
18. Assheton Smith, <i>supra</i>	—	—	At least 15 months
19. Butler, Oxford, Zool. 1888, 13	Obtained November, 1866	March 1, 1868	At least over 15 months

* The birth of one litter is there stated to have taken place in April, which is a misprint for March, as shown by 'The Zoologist,' 1888. (I have not been able to refer to the 'Field' of 1861.)

Mr. Meade-Waldo's case, though the gestation is only a matter of great probability, at least proves unquestionably that Badgers (of both sexes) may become parents by the time they are about thirteen months old; and therefore that in such cases the gestation must be considerably less than twelve months.

Mr. Paterson saw an undoubted pairing on July 12th, 1898, followed by a birth on the following 13th February. The solitary cub was apparently premature, but at any rate the gestation seems proved in this case to have been in fact seven, and, as if it ought to have been, eight months; and the subsequent cases in Mr. Paterson's collection were probably also between seven and eight months.

We are justified, I think, in inferring that the young in case No. 6 would have been born the following season, and therefore the gestation would have been at least nine months.

The veteran field-naturalist, Capt. Salvin, wrote in 'The Zoologist,' 1877, p. 251, as an undoubted fact: "I can now settle that vexed question—the gestation of these curious animals—for this Badger has gone with young a year all but about seventeen days." He mentions that the same Badger had bred the previous season on Feb. 27th, and, as the second litter was born on Feb. 16th, the parents must have paired six days after the birth of the former litter.

The cases numbered 7, 8, 9, 10 may fall in very well with this period, while in No. 12 it is reasonable to suppose that the Badger had been captured at least one day before it was received at Regent's Park, and so must have been with young at least twelve days longer than Capt. Salvin's example.

No. 13 seems to agree with 12, and then the interval—though in each case there is a lack of precise dates, and therefore there is a possibility of (unintentional) inaccuracy—grows over the twelvemonth; and the last three instances extend to fifteen months, and even over, and as the last case has dates, it carries some weight. I remember the man when I was at Oxford, and purchased my first pair of Badgers from him in June, 1871. I recollect hearing of the case both from him and another man, but that of course does not prevent the possibility of error as to the date when he had acquired the female Badger.

Whatever Badgers may be as to gestation, the available

evidence shows that they are of all animals the most regular in their season for parturition. Out of twenty instances of Badgers breeding, in which either the exact date or the approximate date to within a very few days is recorded, all are between Feb. 10th and March 21st; twelve (or thirteen) in the latter month, eight (or seven)* in February.

No doubt a larger series of cases would somewhat extend these limits, but their number seems sufficient to show that any birth outside the two months of February and March may be considered as exceptional.

Unfortunately in most cases where a remarkably long gestation has been recorded, no mention is made of the date when the young were born (or when the female was obtained), but as in every case where the date of birth is given it is perfectly normal, it is evident that there is not the slightest evidence to support the common assertion that the female Badger has the power of suspending parturition (at least not in the way imagined). But, on the other hand, I see no escape from the very curious conclusion, that the pairing may take place at any time during a range of some ten months, and yet that the young are always born within a season limited to about six weeks. In other words, it appears that the gestation may amount to anything between under five and over fifteen months, and yet that the young are all born within some six weeks of each other; and, moreover, that the females which paired earliest by no means necessarily whelp earlier during the six weeks' season than others which paired several months after them!

It seems probable, however, so far as our very slight information goes, that the length of gestation is correlated with a varying degree of maturity in the young when born.

A sentence of Mr. Paterson's bearing on this point must be here repeated. He writes:—"Any person first seeing a Badger at birth would naturally conclude that it was born much before time. All mine were completely nude, and for six weeks blind."

In the case quoted (above) from 'Land and Water,' the two young (both of which were females) were blind for twenty-nine days. In the litter bred in my collection in 1903 I could not be

* This allows for Mr. Paterson's case, which was supposed to be premature.

certain on this point owing to the interior of the bed-box being very dark, but believe their eyes opened about the thirtieth day.* Mr. E. W. Holdsworth (quoted by Mr. Harting, Zool. 1888, p. 11), describing cubs born in the Zoological Gardens on March 12th, 1862, which all died in the course of forty-eight hours, says:—"They were well covered with short greyish-white hair, and had the two dark facial stripes faintly marked." The largest of the four cubs weighed a little more than 3 oz., and measured in extreme length 7 in. "The young did not resemble those of the *Ursidæ* in being abnormally small."

Judging the young born in my collection only by imperfect glimpses in a dark box, I cannot speak with certainty, but do not think they were so big at two days old; at any rate, at their deaths, aged thirty-eight and thirty-nine days, they only measured about $11\frac{1}{8}$ in. each in total length.

In this connection may be noted Mr. Paterson's observation that the cub born after seven months' gestation was obviously more immature than others born after a gestation lasting a few weeks longer.

Different writers give different estimates of the ordinary number of young in a Badger's litter. In twenty-five cases the number has varied from one to four; two is the commonest number; while the *average* comes out at about $2\frac{1}{2}$.

As it is only by the accumulation of facts that the above conclusion—which I confess is a decidedly startling one—can be confirmed or refuted, I would venture to beg that all who can contribute any single scrap of evidence will be good enough to send it either to 'The Zoologist' direct or to me.

* I have never seen the fact noticed, that the right eye of young mammals opens before the left. I do not remember an exception among wild animals, nor even among domestic animals, though it is very likely some occur in the latter class. From the time the lids of the right eye begin to part to the time the left eye is fully opened takes generally from thirty-six to sixty hours.

NOTES AND QUERIES.

AVES.

Richard's Pipit (*Anthus richardi*) in Cornwall.—On Dec. 22nd I watched for fully an hour a Richard's Pipit on the sandhills near Hayle. The bird was hawking for insects, and allowed me to crawl through the bent to within a few yards; I was thus, with the help of glasses, enabled to see the details of the plumage very minutely. The size and length of limb and tail were very striking. The whole appearance of the bird resembled a Wagtail more than a Pipit.—H. ELIOT HOWARD (Clareland, Stourport, Worcestershire).

Great Grey Shrike (*Lanius excubitor*) in Lancashire.—I had an opportunity a few days ago of examining a fine specimen of this bird, which had been shot near the River Mersey, at Urmston, on Jan. 23rd last, by Mr. S. Tate, of Stretford, who has had it preserved. Judging by the faint grey edges of the breast-feathers, it is an adult female. The double white wing-bar was well defined.—FRANK S. GRAVES (Ballamoar, Alderley Edge).

Waxwings in East Anglia.—The visitation of *Ampelis garrulus* to East Anglia during the past winter has perhaps been the largest since 1866-7, when upwards of one hundred and fifty were obtained in Norfolk alone. Mr. Lowne, of Yarmouth, and Mr. Clarke, of Snettisham, have kindly told me that they have had about thirty and fifteen respectively; and Mr. Bunn, of Lowestoft, has had several, one of which (a male in good plumage) he sent to me in the flesh about the middle of December. Others have been recorded in the local press, so the total number obtained must have amounted to about sixty.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

Greenland Falcon (*Falco candicans*) in Co. Donegal.—During the last week of December an immature Greenland Falcon was trapped by one of the tenants on Horn Head.—H. ELIOT HOWARD (Clareland, Stourport, Worcestershire).

Migration in 1903.—I would like to ask the question, in order to set others—as well as myself—a-thinking: How (why) has it happened

that, in 1903, we had such an abnormal immigration of Rough-legged Buzzards, Great Grey Shrikes, Waxwings, and other rarities, with the meteorological phenomena of *mild wet* weather and strong prevalence of westerly winds? In *severe* winters we are not astonished to meet with rare continental visitants, and usually mild wet autumns and winters in the British Isles are not accompanied by abnormal flights of continental rarities. Why have we such an exception as in 1903? Are the European centres becoming in any way congested and over-filled? Is it a natural pressure there, independent of climatal conditions? We had a record season in Woodcocks in 1903 for the mid-land counties of Scotland, but merely *dribblets* of these birds in Shetland, as compared with 1902, which was their record year! On the other hand, *Snipe* have been scarcer than normal, in 1903. In May, 1902, scores (hundreds more likely) of Snipes perished, due to frost (17° on 3rd May). But Woodcocks bred *freely*, and reared their young about the same time in *better* sheltered localities—*here*, and in the central counties of Scotland. Here Woodcocks had *second layings*, and hatched these out quite a fortnight later than normal. I had twelve nests (at least) on an acreage of coppice of some twenty-two acres in 1902, but in 1903 just the usual number of some three to four nests (*i. e.* of Woodcock). Scores of dead young Snipe were found at same time on exposed ground, lying within five to fifteen feet of the newly-hatched shells of the eggs. This was upon the 4th May (17° of frost the night—or two nights—before!). Both Snipes' and Woodcocks' were probably second layings. The questions I have asked, *I think*, are worthy of some thought.—J. A. HARVIE-BROWN (Dunipace, Larbert, Shirlingshire, N.B.).

Birds of Oxon or Bucks.—I am obliged to Mr. Aplin for pointing out the confusion near the top of p. 85. The first sentence, "Turville Park" to "county," refers to the Ring-Ouzel; from "Reported" to end of the paragraph, to the Golden Oriole. I question whether the Ring-Ouzel is still to be "seen every season about the borders of Turville Park," though it *may* possibly be only for want of being looked for. On p. 86, line 3, "the river off" is of course a *lapsus* for "the river at."—A. H. COOKS (Poynetts, Skirmett, near Henley-on-Thames).

Rare Birds in Berkshire.—I am indebted to Mr. G. A. Topp, taxidermist, of Reading, for the following notes:—Merlin (*Falco aesalon*). Female shot at or near Twyford, Jan. 20th, 1904. Common Guillemot (*Uria troile*). Picked up dead near Newbury, Feb. 18th. Previously seen alive by Mr. Shooter. This is the only record of a Guillemot

for Berks. Sheld-Duck (*Tadorna cornuta*). Fine female picked up exhausted at Shinfield. The only other records I have are one shot at Newbury, 1806 (Dr. Lamb), and another seen during the winter of 1867-8 near Cookham ('Birds of Berks and Bucks,' p. 205). Mr. T. Dewe kindly informs me a Shoveler (*Spatula clypeata*) was shot at Manor Farm, Longworth, Feb. 18th. I have two previous records of this bird in Berks. — HEATLEY NOBLE (Temple Combe, Henley-on-Thames).

Old or Local Name. — What is the bird called by Drayton the *Tydie*? (vide "Poly-olbion," The Thirteenth Song). Describing the birds of the Forest of Arden, he writes:—

"And of these chanting fowls, the *Goldfinch* not behind,
That hath so many sorts descending from her kind.
The *Tydie* for his notes as delicate as they,
The laughing *Hecco*, then the counterfeiting *Jay*."

The *Hecco* is, of course, the Green Woodpecker (Hickle or Eacle). Drayton mentions also the *Throstle*; the *Woosell* ("that hath a golden bill"), also alluded to as the *Merle*, playing upon his "dulcet pipe"; the Nightingale; *Linnet*, *Wood-Lark*; *Reed Sparrow*; *Nope*; *Red-breast*; *Wren*; and the *Yellow-pate* (perhaps the Yellow Bunting). Drayton's knowledge of birds was rather hazy, for it is of this last that he sings—

"Which though she hurt the blooming tree,
Yet scarce hath any bird a finer pipe than she."

A remark which should apply to his *Nope* (Bullfinch). A fine description of hunting the Stag is to be found in this song. Perhaps some Warwickshire reader can tell me what the *Tydie* is.—O. V. AFLIN (Bloxham).

ARACHNIDA.

How many Ovum-cocoons has a Spider after being once impregnated? — In 1901 I had under close observation a female Spider (*Tegenaria atrica*), which I placed in a large glass jar, the top being covered with a piece of gauze, kept in place by a slip-knot, and this was only loosened at feeding-time to allow a corner being lifted. During its captivity, which lasted some eighty days, when abiosis supervened, this Spider made in succession nine ovum-cocoons, as follows:—June 1st, two; 16th, one; 23rd, one; July 2nd, one; 15th, one; 25th, one; August 4th, one; 17th, one. The ovum-cocoon is constructed after the following manner: The acetabuliform receptacle of fluffy silk* is first made, which, as is usual with this species, is attached to

* This is formed by the spinnerets being raised up and down.

the under side of the web, into which a number of ova are exuded, this act occupying about five minutes. After resting awhile the Spider begins moving round the egg-mass, touching lightly here and there with the spinnerets. In a short while a globular cocoon is formed, about the same size as that made by *Dolomedes mirabilis*, viz. about one-third of an inch. The ova are pale yellow; the ovum-cocoon is, when freshly made, white, but after awhile becomes brownish. In the natural state the cocoon is often covered with rubbish, viz. the remains of insects, &c. The ova are hatched in about forty-five to fifty days. T. EDWARD BELCHER (24, Clephane Road, Canonbury, N.).

BIBLIOGRAPHY.

Proposed General Index to 'The Zoologist.'—Of recent years I have had occasion to continually refer to many of the old volumes of 'The Zoologist.' In so doing I have found that the absence of a continuous index is a great drawback. Each yearly volume has been indexed separately, but there is no index to the whole series, which now consists of over sixty volumes. To find a reference by hunting through all the yearly indexes is a work which entails great labour and much loss of time and temper. Moreover, the indexes of some of the earlier volumes are not so full as could be desired, and require a considerable amount of revision. It therefore seems to me that the time has arrived for the publication of an entirely new index to the first sixty volumes of 'The Zoologist,' i. e. 1843 to 1902, and I am writing this letter with the object of ascertaining to what extent my view on this matter is shared in by readers of 'The Zoologist' and students of natural history. The question what form the index should take is a subject on which I should be glad to have some expression of opinion. It has occurred to me that the best method would be to have an index of subjects—for instance, an index containing all the references to birds might be first published, and might be followed by other volumes on mammals, fishes, insects, &c. The method I suggest for compiling the index may be seen from the following examples, which I have taken from the volumes for 1843, 1844, 1845. As the numbering of the sixty volumes of 'The Zoologist' from 1843 to 1902 is not continuous, the references, I think, ought to be indexed not under the heading of the volume, but of the year. A few specimen headings are subjoined:—

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I should be very glad to receive expressions of opinion from readers of 'The Zoologist' on the following points:—1. Is such an index needed, and is it likely to receive a sufficient amount of support to warrant its publication? 2. Is the division of the index into subjects advisable? WATKIN WATKINS (3, Paper Buildings, E.C.).

Birds of the Isle of Man.—Since my former request for information on this subject a considerable amount of interesting matter has been acquired, but before the work, which is now nearly ready, is placed in the publisher's hands, I should be glad to receive any further notes, which will be duly acknowledged. Information is particularly desired with regard to the following:—Whinchat, Garden-Warbler, Lesser Whitethroat, Wood-Warbler, Dipper, Twite, Merlin, Rock-Dove, the species of Grey Geese, and sea-frequenting Ducks. — P. G. RALFE (Castletown, Isle of Man).

NOTICES OF NEW BOOKS.

The Direction of Hair in Animals and Man. By WALTER KIDD, M.D., F.Z.S. Adam & Charles Black.

THIS book constitutes a renewed assertion, with fuller argument, and the addition of new facts, to the views of the author originally promulgated in a volume entitled 'Use-Inheritance,' &c. (cf. Zool. 1901, p. 433). Dr. Kidd is a Darwinian evolutionist, but, with many other thinkers, admits a strong Lamarckian factor as opposed to the views of the Exclusive Selectionist, the Neo-Darwinian, or the pure apostle of Weismannism. He describes with minute scrutiny the nature and direction of the hair on mammals, including man, regards "use-inheritance" as proved, and evidence for the view that acquired characters can be inherited, and is thus outside the circle of the dominant school in evolution. Nevertheless, though this book can of course be ignored, its arguments cannot be suppressed, and it is well to protect Darwinism from being first revised by the neologist, and then promulgated as an infallible doctrine.

In our notice of the preliminary publication we have referred to many of the facts relied on by Dr. Kidd, and which need not now be repeated. After seeking for an explanation of the phenomena by the arguments of Creation, Selection, or Use and Habit, he accepts the last theory, which he states "is equivalent to a mechanical view of the production of hair direction, and must be resolved into certain component parts and diverse forces. These are Pressure, Gravity, and Underlying Divergent Muscular Traction." We may subsequently gauge the trend of his opinion when discussing the direction of the hairs on the Orang. On the arm and forearm of this animal the long reddish hair slopes towards and beyond the point of the elbow, where it shows longer hair in this part than any other Anthropoid Ape, and this, it has been suggested, provides a thatch for running off the rain. Our author here remarks: "The selectionist would say it is produced *for* the rain to flow over easily. I would suggest that it is produced *by* the rain flowing over it"; and here the Neo-Darwinian will at once scent the noxious heresy of Lamarckism.

As clearness of expression is so absolutely required in this discussion—and Dr. Kidd, in reference to man, is not afraid to write of his "hairy, arboreal, ape-like ancestors"—we would suggest that the words in his title "Animals and Man" might have been better expressed as "Man and other Animals."

THE ZOOLOGIST

No. 754.—April, 1904.

BIOLOGICAL SUGGESTIONS.

RIVERS AS FACTORS IN ANIMAL DISTRIBUTION.

Part I.—RESTRICTIVE ACTION.

By W. L. DISTANT.

I believe laws discover themselves to individuals, and not that individuals discover laws.—EDW. FORBES.

I think it undesirable to give expression to theories which one may afterwards feel oneself committed to, as the investigation goes on. . . . I have often noticed in my younger sporting days—and it is a fact well known to sportsmen—that some hounds are apt to give tongue before they have got a true scent, whilst there are others whose voice can be relied upon. I am an old dog, and have always had a disposition to run mute.—Gen. PITT-RIVERS.

SOME years ago I beguiled many very quiet hours on the Transvaal veld by taking stock of my zoological note-books, and seeing how far the facts and observations I had accumulated could aid me in a solution of some biological questions which I had often pondered, but never answered. Among these was the part that the principal rivers of the earth had played in the cleavage lines of animal distribution. I had no theory, nor did I find one; for, though it seemed clear that rivers undeniably were, and had been, barriers to the migration of plants and animals, yet, on the other hand, it was equally apparent that

most land animals could, and did on necessity, swim, and therefore to a great extent overcome these obstacles. Still there was so much to be said on both sides of the question, that I have continued gathering evidence, and have thought it well to publish some of the facts thus acquired, in the hope that other zoologists may also bring grist to the mill. A biological enquiry which is still unencumbered with a theory is surely a very uncommon phase of modern thought, and should be attractive on that ground alone. It is, however, suggestive to the last degree, and appertains as much to the requirements of the historical method, or perhaps more so, than to the seductive paths of speculation. I have dealt with the question in its rather contradictory phases, in this instalment recognizing the divergent action of rivers on animal distribution, and in a subsequent paper propose to record some distributional action of rivers, and to give details of land animals that can, or rather have been observed to swim.

Although rivers in the course of time have often, and do often, shift their channels, as Lyell demonstrated of the Thames and Mersey, sometimes deserting and subsequently resuming their former beds, as shown, for instance, by the courses of the Ardèche,* they still, in most cases, possess a considerable antiquity,† and have proved factors in the determination of

* Mardigny, cf. Marsh, 'Man and Nature,' p. 402.

† According to Prof. Geikie, there can be no doubt that both in Europe and North America the rivers at a comparatively recent geological period had a much greater volume than they now possess ('Text-Book Geology,' 2nd edit. p. 370). In North America the duration of the Niagara has been computed as equalling 82,000 years (J. W. Spencer, 'Am. Journ. Sci.,' December, 1894). These changes cannot always be ascribed to a great antiquity. Dr. Gregory, in discussing the former sources of the Nile, remarks:—"The proof which I hope subsequently to publish of the Pleistocene age of some of the meridional faults, and of the existence of a former outlet from Baringo over the Lobat Pass to the north, shows that the river system must have been very differently arranged in times geologically quite recent" ('Geographical Journal,' vol. iv. p. 518). Monsioa, a Bechuanaland chief, at the time (1890) more than eighty years of age, told Mr. Bryden that "he remembered Sea-cows (*Hippopotamus*) in the Molopo, and the Molopo of to-day, which, like other South African rivers, has dwindled greatly, would find it a hard matter to hold a single Sea-cow" ('Gun and Camera in South Africa,' p. 89). Mr. Bryden further remarks:—"Anciently, and before some

animal distribution. The interesting history of European rivers still remains to be written. They did not always flow along their present courses, and the Rhone appears to have been a great traveller. At least there seems reason to believe that the upper waters of the Valais fell at first into the Danube, and so into the Black Sea; subsequently joined the Rhine and the Thames, and so ran far north over the plains which once connected the mountains of Scotland and of Norway to the Arctic Ocean, and have only comparatively of late years adopted their present course into the Mediterranean.*

As a general rule even narrow seas are an effectual obstacle to migration; "in many cases wide rivers are equally effective barriers."† In Queensland, according to C. Lumboltz: "About 250 miles from the coast we passed the part of the Great Dividing Range which here forms the watershed between Eastern and Western Queensland. In this part the watershed consists of a low range. Nevertheless, no one can fail to observe the great difference in animal life on the two sides, as well as the inter-

great upheavals and changes in the land took place (changes that were probably most acute in the immense water systems of the Zambesi and Ngami countries, before the Zambesi was torn from its ancient southerly course and diverted to its present channel), Bechuanaland and the Kalahari must have been exceedingly well watered. Many an old rivershed, long since dry and useless, testifies to the fact" (*ibid.* p. 115). During the great drought of 1862, "the mighty Orange River could be stepped across by a child, and in its upper part at least ran dry, exposing in its bed near Hope Town the remains of a waggon which had been lost in a sudden flood while crossing the river some thirty years before" (*cf.* 'Hydrology of South Africa,' by J. Crumie Brown, p. 112). Mr. Sharpe, in an article on British Central Africa, writes:—"With regard to the drying up or otherwise of African lakes and streams, I am inclined to doubt the theory that there is a desiccation of a permanent kind going on—that is, I mean, a drying up due to a *permanently decreasing rainfall*. It is, I think, more reasonable to suppose that, owing to some cause which is not as yet apparent, there are regular cycles in the lake regions of Africa, due to increasing and decreasing rainfalls" ('Geographical Journal,' vol. vii. p. 367). That a full average rainfall is essential is proved by the statement of Anderson in Damara Land, that so great is the rate of absorption and evaporation at this season (December and January), "that pools of from forty to fifty feet long, and several feet deep, would dry up in the course of a week" ('The Okavango River,' p. 146).

* *Cf.* Lord Avebury, 'The Pleasures of Life,' pt. i. p. 127-8.

† Dixon, 'The Migration of British Birds,' p. 102.

mediate change in the character and aspect of the country. No sooner is the range passed than we meet with the Red-breasted Cockatoo (*Cacatua roseicapilla*), which is never found on the eastern side."* Darwin, of course, noticed and recorded the same facts. He writes:—"On the opposite sides of lofty and continuous mountain ranges, of great deserts, and even of large rivers, we find different productions."† Students of mammalian geographical distribution often find the great rivers real divisional lines. Quite recently W. L. Sclater, in separating the subregions of the Ethiopian region, has used the watersheds of the Senegal, Congo, and Tana rivers for that purpose.‡ Even the distribution of the Tsetse-fly is similarly affected. Anderson states that "cattle may be seen grazing securely on one side of a river, whilst the opposite bank swarms with the Tsetse."§ Livingstone found the banks of the Chobe River separating the areas of this insect. "We lived two months in their *habitat*, which was in this case as sharply defined as in many others, for the south bank of the Chobe was infested by them, and the northern bank, where our cattle was placed, only fifty yards distant, contained not a single specimen."|| And Austen, who has recently monographed these flies, states that, although the Tsetse no doubt occurs throughout Portuguese West Africa, there appears to be no record whatever of its having been met with south of the Congo.¶

It is, however, again necessary to reiterate here, and that most strongly, that no universal law of the kind can be found, nor is the existence of such a constant factor in animal distribution advocated,** the desire of the writer being merely to show that there are facts to prove such a connection in many cases, and

* 'Among Cannibals,' p. 84.

† 'Origin of Species,' 6th edit. p. 817.

‡ 'Geographical Journal,' vol. vii. p. 287; and in collaboration with P. L. Sclater, 'Geography of Mammals,' p. 100.

§ 'Lake Ngami,' p. 488.

|| 'Miss. Trav. and Researches in S. Africa,' p. 81.

¶ 'Monograph of the Tsetse-Flies,' pp. 29-30.

** In his paper on "Biologic Regions and Tabulation Areas," Mr. C. B. Clarke states that a great river will not do for use as a permanent boundary line, "as nearly all the plants that grow on one bank may usually be found on the other" ('Phil. Trans.' vol. clxxxiii. p. 376). Readers of Buckle's 'Hist. Civilization' will probably remember an early footnote to the effect that

that many other facts and observations bearing on the question require collation. As far as his knowledge extends, in a *general* way rivers do *not* qualify the distribution of genera and species, but in a much more *limited* sense they *do*, and such facts demand consideration. Though Nature works on the same plan, she does not always use the same means, and the danger of advancing all-sufficing theories, or promoting frequent causation to a universal position, is that the equally true though infrequent factors are too often ignored or put out of court altogether. Again, great care is necessary in dealing with reports made by travellers on these fluviatile divisions, especially in areas which have been little zoologically investigated, as subsequent discovery often proves genera and species to exist where their non-extension was regarded as an almost axiom.

Reports on the distributional action of the River Congo will illustrate the last remarks. Mr. Monteiro, with reference to the southern banks of the river, states:—"The difference in the scenery and vegetation from those of the north is very great indeed, and not less so is that of the birds and animals (*sic*). I have noticed enough to convince me that it would well repay a naturalist to investigate the number of species this river cuts off, as it were, from Angola."* "Sharks, so frightfully dangerous in the surf of the West Coast, are unknown south of the River Congo. I have never heard of a person being attacked by one, although at Loanda the white population bathe off the island in front of the town, and blacks dabble about in the sea everywhere, and swim to and from the boats and barges."† The author then proceeds with other statements which have been subsequently controverted. "The Gorilla and Chimpanzee, for instance, are only known north of the Congo; they are found at Loango and Landana, and, from reports of the natives, even near to the river itself; many species of monkeys, very abundant at Cabinda

"the Oregon or Columbia, as it is sometimes called, forms a remarkable botanical line, which is the boundary of the Californian flora." In California, Mr. Hinchliff travelled along by the side of a small river where the countless lupines were all white on one bank, and all blue on the other ('Over the Sea and Far Away,' p. 247).

* 'Angola,' vol. i. p. 58.

† *Ibid.* p. 51.

and on the north bank, are quite unknown in Angola; and the ordinary Grey Parrot, which is to be seen in flocks on the Congo, is almost unknown to the south, the only exception to this rule, as far as I have been able to ascertain, being at Cassange, about three hundred miles to the interior of Loando, where the rare 'King-Parrot,' with red feathers distributed among the grey ones, is not uncommon. Of small birds, I have noticed many at Cabinda that I never observed in Angola; the same with butterflies and other insects."* Most of these last statements have been traversed by Sir H. Johnston, who writes:—"I have read in many works on Africa, or on the distribution of plants and animals, that the Congo was the southern boundary of the habitat of the Grey Parrot, the Anthropoid Apes, and the oil-palm (*Elaeis guineënsis*). Now the Grey Parrot reaches perhaps its greatest development in Malanje, a district of Angola nearly three hundred miles south of the Congo, and, together with the oil-palm, continues to be found as far as the tenth degree south of the equator; while the Anthropoid Apes can hardly be said to be limited southward in their distribution by the lower courses of the Congo, for they do not reach even to its northern bank, or approach it nearer than Landana, one hundred miles away."† More evidence is evidently required here, and that of an analytical nature. In most instances an average result can alone be expected, for it is scarcely reasonable to believe that animal migration—both intentional and accidental—was rendered altogether nugatory by even the mighty stream of the Congo, exceeding in volume all the rivers in the Eastern Hemisphere, and in the west surpassed by the Amazons alone; while at the same time it is not unreasonable to suppose that in earlier times its separative character on the fauna was more pronounced, for animal migration is spasmodic, and requires time for perpetuation in result. Dr. Gadow, in one of the British Museum Catalogues of Birds, has recorded the interesting fact that specimens of *Lanius collaris* from the Congo have a red under surface, south of the Congo this colour is changed to orange.‡ Mr. Beddard

* 'Angola,' vol. i. p. 58.

† 'The River Congo,' p. 818.

‡ This requires qualification, as Ogilvie-Grant, in a recent revision of the Shrikes, specifically divides the specimens placed by Gadow as appertaining to *Lanius collaris* ('Novitates Zoologicæ,' vol. ix. p. 466).

admits the divisional effect of this river on the fauna of the country when he defines the West African subregion as extending "as far south as the Congo."*

Confining our attention to the same continent, we may find examples from other rivers. The main stream of the Mackenzie River—a considerable tributary of the Tana, and so named by Chanler and Von Hohnel—may, according to Neumann, be taken as the line of demarcation limiting the ranges of both Coke's Hartebeeste and Grevy's Zebra.† Selous, writing in 1881 on the Giraffe, states that till within the last few years it was never found eastward of the River Gwelo (a tributary of the Zambesi north of Matabeleland), though it was always very plentiful in the sand-belts to the westward of that river. This fact is the more curious, since the soil, vegetation, and general appearance of the country are precisely similar on both sides of the river, which during a great portion of the year is only a succession of pools, and therefore does not offer the slightest obstacle to any animal desirous of crossing it. During the last three or four years a few Giraffes have extended their range further eastward.‡ We may perhaps here hazard the supposition that in more ancient times this waterway was of a deeper and more extensive description, and that the experience of a restricted range once caused by a physical barrier, became by hereditary transmission a conservative "instinct" in the minds of these animals, who thus seldom or never attempted to ford what was at one time a dangerous or impassable current. How often in the mental evolution of ourselves the memory of a dead legend keeps us from the easy path of truth. It may also be that the presence of Crocodiles or Alligators may often prove efficacious in preventing animals extending their range beyond a river. Bryden, when hunting on the banks of the Botletli, in South Africa, found that the Lechwè (*Cobus leché*), when pursued,

* 'Text-Book of Zoogeography,' p. 101.

† 'Elephant Hunting in East Equatorial Africa,' p. 27.

‡ Quoted by Lydekker, 'Roy. Nat. Hist.' vol. ii. p. 388.—According to Sandeman, "a Giraffe is the most defenceless animal imaginable, and has nothing to show fight with even if so inclined; it is easily tired out and run down, so, although fleet for a short distance, it does not afford much sport" ('Eight Months in an Ox Waggon,' p. 324).

always betook themselves to the water and reeds, but rarely faced the open river. One wounded individual that did brave the stream was snapped away by a Crocodile.* On the other hand, on the South American Purus, Paul Fountain describes the Deer as taking freely to the water, though several times he saw them pulled under by Caymans.† Lydekker, quoting from the writings of Milne-Edwards and Grandidier, and dealing with the Sifakas (Lemuroids) of Madagascar, relates that the various races and species are so sharply separated from one another, "that it is sufficient to cross a river—it may be of no great width—in order to find that, while on one bank all the Sifakas belong to one race, on the opposite bank they will be of another race, if not of a distinct species."‡ In Algeria, Moritz Wagner observed that the rivers which run from the Atlas range to the Mediterranean, without being very broad, still served as distinct barriers. He found certain of the smaller rodents and reptiles, certain species of beetles and snails, to be confined by the River Schelif, which they never crossed.§

In India a similar story is told in relation to the River Ganges. According to Mr. Lockwood, the district of Monghyr, which consists of some four thousand square miles, is divided into two nearly equal portions by the Ganges. The northern part is an extensive plain formed by the rich alluvial soil brought down by the ever changing river, whilst the southern portion consists of vast rice-tracts, and forests which cover the metamorphic hills, extending far away into Central India from the town of Monghyr, three hundred miles north-west of Calcutta. "This division of the district separates also in a marked manner the most conspicuous species of the animal and vegetable kingdoms, and the sportsman who to-day may find Tigers, Bears, Baboons, Tupaias, Peacocks, Jungle-fowl, and Grey Partridge in the undulating country of the south, will look in vain for such things if to-morrow he crosses the river northward. The river

* 'Gun and Camera in S. Africa,' p. 865.

† 'The Great Mountains and Forests of S. America,' p. 381.

‡ 'Roy. Nat. Hist.' vol. i. pp. 208-9.

§ Quoted by Strauss, 'The Old Faith and the New,' 2nd edit. p. 221. (Probably extracted from Wagner's 'Reisen in Algier,' a work with which I am unacquainted.)

separates also the most conspicuous trees and plants. In the forests of the south are found the ebony-tree (*Diospyros melanoxylon*), the sál (*Shorea robusta*), and the mahwa (*Bassia latifolia*). The south also yields vast quantities of rice and 150 tons of opium grown on 25,000 acres of land, whilst after crossing the Ganges little rice and not a single poppy will be seen. In the north nine-tenths of the trees are cultivated mangoes, whilst wheat, Indian corn, various kinds of millet, peas, masur (*Cicer lens*), rahar (*Cytisus cajan*), oats, indigo, mustard, linseed, and castor-oil are the principal crops which the landholders find profitable to grow.* Mr. Hornaday, the American naturalist, who so thoroughly collected zoological specimens during the limited time he spent in India, also casually bears witness to the same and similar facts. "The Indian Black Bear inhabits all India south of the Ganges."† The Indian Gazelle (*Gazella bennetti*), commonly called by Indian sportsmen the "Ravine Deer," "does not occur south of the Godavery River."‡ In Assam the Gibbons (*Hylobates*) do not occur north of the Brahmaputra River.§

River faunas are often considerably modified and specialized by the direction in which rivers flow, or the sea or ocean into which they empty themselves. Sir Joseph Hooker long since pointed out: "It is one of the most remarkable facts in the zoology of Asia, that no Trout or Salmon inhabit any of the rivers that débouche into the Indian Ocean (the so-called Himalayan Trout is a species of Carp). This widely distributed natural order of fish (*Salmonidæ*) is, however, found in the Oxus, and in all the rivers of Central Asia that flow north and west. The central Himalayan rivers often rise in Tibet from lakes full of fish, but have none (at least during the rains) in that rapid part of their course from 10,000 to 14,000 ft. elevation; below that fish abound, but I believe invariably of different

* 'Nat. Hist. Sport and Travel,' pp. 1-8.

† 'Two Years in the Jungle,' p. 146.

‡ *Ibid.* p. 72.

§ Heilprin, 'Geogr. and Geol. Distr. Animals,' p. 81.—Mention must not be omitted of Dr. Blandford's classical Memoir on the Distribution of Vertebrate Animals in India, Ceylon, and Burma, and of the use made by him of the Nebrudda and Kistna rivers ('Philosoph. Trans.' vol. cxciv. p. 845).

species from those found in the sources of the same rivers. The nature of the tropical ocean into which all the Himalayan rivers débouche is no doubt the proximate cause of the absence of *Salmonidæ*.*

As with "Mimicry" and "Protective Resemblance," the solution of the riddle of geographical distribution must depend largely on the teachings of geology and palæontology. The explanation of the present is only made possible by the story of the past. Embryology, Anthropology (including Sociology)—nay, even most biological enquiries—are better understood the farther we go back. In the beginning was the great evolutionary impulse. Dr. Gregory has well remarked: "The anomalies of zoological distribution, especially in regard to the fresh-water faunas, appear still more difficult of explanation, unless considered in the light of geological changes."† Some of the large rivers still contain living links with the Triassic strata of Europe, and secondary rocks of India and South Africa, in the existing Lung-fishes (*Lepidosirenidæ*). In the Burnett and Mary rivers of Queensland, the Australian Lung-fish (*Ceratodus forsteri*) is generally considered a distinct generic survival, whilst the Mud-fish of the Amazons (*Lepidosiren paradoxa*), and its African relation (*Protopterus annectans*), so abundant in the Gambia, bear witness not only to the antiquity of the animal type, but also to the age of the streams in which they are still found.

The rivers of the American continent have a similar character. Mr. Wallace has given the cases of certain species of Saki Monkey

* 'Himalayan Journals,' vol. ii. p. 187.—The Salmon is unknown in any of the rivers flowing into the Mediterranean ('Roy. Nat. Hist.' vol. v. p. 495). It is also stated that in South Africa, Crocodiles "are only found in the rivers which run to the eastward" (J. Garbett Wood, 'Through Matabeleland,' p. 48). The temperature of rivers also may vary in places in a very qualifying manner for piscian distribution. E. André describes a stream as being in temperature several degrees lower than that of the Caura, owing to its being completely shaded from the rays of the sun by the tall trees of the forest through which it flows ('A Naturalist in the Guianas,' p. 137). Of course waterfalls are always obstacles. "In the Yosemite Valley, in California, for example, the Trout ascend the Merced river to the base of a vertical fall. They cannot rise above this, and so the streams and lakes above this fall are destitute of fish" (Jordan and Kellogg, 'Animal Life,' p. 274).

† 'Geographical Journal,' vol. iv. p. 512.

(*Pithecia*) found on either side of the Amazon River, whose range either southward or northward appears to be limited by that stream. The same authority instances among birds species of Jacamar (*Galbula*) and Trumpeter (*Psophia*), which exhibit a similar limitation, particularly the latter, where five distinct species are relegated to as many distinct, but contiguous, geographical areas, separated from each other by the Amazon and some of its tributaries (Negro, Madeira, Tocantins). Of about twelve species of Armadillo (separated by some naturalists into several distinct genera), most of which are inhabitants of Brazil, it would seem that not a single species is common to Brazil and the Argentine Republic, or the Argentine Republic and Paraguay, the Parana River, with its tributaries, evidently forming an insurmountable barrier to the passage of this animal.* The Uruguay River appears to limit in the same manner the eastward progression of the Viscacha (*Lagostomys trichodactylus*), an animal allied to the Chinchilla, although, as has been pointed out by Darwin, the trans-Uruguayan plains are fully as well adapted to the animal as those of its native home.† The Gallinazo, a South American Vulture (*Cathartes atratus*), is stated by Darwin as never found south of lat. 41°,‡ or the Rio Negro.

We often find considerable ethnographical differences when a great river has been crossed. According to Keller: "It is a remarkable fact that the Indians on the right shore of the Amazon neither prepare nor use the poison (urary or curare—arrow-poison), though the plants that supply the chief ingredients are certainly found there as well as on the left shore, on which tribes differing widely in custom and language use the subtle weapon."§ According to Waterton, "the wourali-poison is used by all the South American savages betwixt the Amazons and the Orinoco."|| We receive a hint as to how rivers may

* However, as Mr. Lydekker remarks, Armadillos "are said to be able to swim well and swiftly" ('Roy. Nat. Hist.' vol. iii. p. 217).

† Cf. Heilprin ('Geogr. and Geol. Distr. Animals,' p. 24).

‡ 'Journ. Research. Voy. Beagle,' edit. 1890, p. 55.

§ 'The Amazon and Madeira Rivers,' p. 110.

|| 'Wanderings,' Wood's edit. p. 126.—The poisoned arrows of Java and Borneo are deadly effective, while those of the Philippines "lose their effect when not fresh" (Ratzel, 'Hist. Mankind,' vol. i. p. 416). When pondering over this question on the Transvaal veld, I ventured to write to Sir Clements

have become divisional barriers among primitive tribes by the remark of Du Chaillu on the intermixture of the same in West Africa, which he explains by the reason that "the most enterprising are always striving to get possession of the rivers, which are the only highways of the country."* In East Africa, according to Faulkner, the Mavite, a marauding tribe of Kulu Kafirs, "have never been known to cross a river. They have visited the western bank of the Zambesi, where they used to come for the purpose of receiving tribute from the Portuguese, but they never crossed the river."† It is said that the people who centuries ago carried on such vast gold-mining operations in Matabeleland and Mashonaland do not appear to have worked north of the Zambesi.‡

Rivers have frequently proved national boundaries, as till recently was instanced by the Orange, Vaal, and Limpopo rivers in South Africa. The Rhine is not a national boundary of to-day, but, as Gibbon writes, Valentian caused its banks "from its source to the streights of the ocean" to be closely planted with strong castles and convenient towers, and thus protected the Gallic frontier against the attacks of the Germans; or, as Peschel remarks, broad and deep rivers are rather barriers and impediments in the first beginnings of society, as, for example, even in Cæsar's day the Rhine quite separated the Celts and the Teutons.§ Renan recognized this fluvial action, and considered the alluvial deposits of the great rivers as appearing to have been very favourable to three or four civilizations, of which we catch a glimpse at a distance of six or seven thousand years from the age in which we live. The Yellow River at the eastern

Markham, as to whether, as a rule, the tribes inhabiting the opposite banks of the Amazon were distinct. I was favoured with the following reply:—"I believe that your view is correct as regards rivers of great width, such as the Amazons. Even along the courses of smaller tributaries the different tribes are often confined to different banks of the rivers, but this is very far from being an invariable rule. Generally, however, in the Amazon basin, the rivers form the divisions between different tribes" (Letter, April 12th, 1895).

* 'Explorat. and Advent. in Equatorial Africa,' p. 388.

† 'Elephant Haunts,' p. 54.

‡ Cf. A. Sharpe, 'Geographical Journal,' vol. vii. p. 370.

§ 'The Races of Man,' p. 197.

extremity of Asia, the Ganges to the south of the Himalayas, the Tigris and the Euphrates in Central Asia, and the Nile in Africa witnessed the expansion of such societies.* The Semitic tribes who crossed the Euphrates into Syria, first of all "trans-Euphratian," but "which had become, by crossing the stream, cis-Euphratian, took the generic name of *Hebrew* (*Ibrim*, 'those of the other side'), though we do not know whether they took it when they placed the Euphrates between themselves and their brethren who remained in the Paddan-Aram, or whether it was the Canaanites who called them 'those from beyond,' or, to be more accurate, 'those who had crossed the river.'"† The Hebrew Scriptures leave no doubt as to the more or less ethnological separation effected by the Jordan.‡ In most large cities the river has formed a social division for the separation of the children of the Ghetto. According to Renan, the Tigris was, on the side of the East, a boundary which Christianity did not pass till the age of the Sassanidæ.

* 'Hist. People of Israel,' vol. i. p. 4.

† *Ibid.* pp. 76-7.

‡ Cf. Deut. xi. 30; Josh. vii. 7; *id.* xii. 1; 1st Samuel, xxxi. 7; 1st Chron. vi. 78; *id.* xii. 87.

(To be continued.)

NOTES ON LAND-BIRDS OBSERVED ON THE NORTH ATLANTIC AND GULF OF ST. LAWRENCE.

BY JOHN TRUMBULL.

I HAVE collected the following occurrences of land-birds during the past five years while crossing to and from the American Continent. Most of them have been observed by myself, and where this is not the case I give the name of the observer who has kindly furnished me with the record. Where occurrences have been noted over two hundred nautical miles from land, the position is given by latitude and longitude, and under two hundred miles, the distance from the nearest land. Nearly all the notes recorded for the last four years were collected on board the R.M.S. 'Tunisian,' and where no vessel is mentioned, that boat is to be understood.

I regret that in a great many cases I have been unable to identify the specimens. I have, however, given the size as compared with some well-known land-bird. Where "small" appears, it is meant to indicate a bird about the size of a Chaffinch or Hedge-Sparrow. Descriptions of birds seen at a distance would only be too meagre, and therefore misleading. Where the hour of day is given, local or apparent time is meant. In nearly all cases where I have kept a record of the weather I have noted it briefly.

1899.

PURPLE SANDPIPER (*Tringa striata*).—Feb. 5th. One settled on board s.s. 'Laurentian' when forty-eight miles S.W. of Cape Sable, and remained an hour during a heavy fall of snow. Strong W. wind.

RED-BREASTED NUTHATCH (*Sitta canadensis*).—June 9th. One flew on board s.s. 'Ruapehu,' Gulf of St. Lawrence; one seen next day (10th) was probably the same bird.

LAND-BIRD (size of House-Sparrow).—June 10th. One seen on board same vessel while off S. coast of Newfoundland.

LAND-BIRD (small).—Sept. 11th. One alighted on board s.s. 'Parisian,' lat. $55^{\circ} 57' N.$, long. $81^{\circ} 41' W.$ Moderate S.W. wind and clear weather.

LAND-BIRD (size of Song-Thrush).—Sept. 11th. One seen on board same steamer, lat. $55^{\circ} 58' N.$, long. $81^{\circ} 2' W.$

LAND-BIRD (small yellow).—Sept. 11th. One seen on board same steamer by a passenger, lat. $55^{\circ} 58' N.$, long. $29^{\circ} 46' W.$ Fresh breeze, overcast, with small rain.

SNOW-BUNTING (*Plectrophenax nivalis*).—Sept. 11th. Two on board, lat. $56^{\circ} 00' N.$, long. $29^{\circ} 05' W.$ Similar wind and weather. 12th. One seen, lat. $56^{\circ} 28' N.$, long. $22^{\circ} 14' W.$ Moderate N.W. wind and clear weather, with passing showers of rain.

LAND-BIRD (small).—Aug. 23rd. Gulf of St. Lawrence. One seen at 2.30 p.m. by third officer of s.s. 'Parisian.'

DUCK (species ?).—Oct. 31st. One seen flying round s.s. 'Californian' for about an hour from lat. $56^{\circ} 12' N.$, long. $32^{\circ} 46' W.$ Half gale, squally, S.W. to W.; heavy sea.

LAND-BIRD (size of Lark).—Dec. 3rd. One seen flying about same ship, lat. $54^{\circ} 49' N.$, long. $26^{\circ} 30' W.$ Fresh S.W. wind, with misty rain. Though I was unable to identify this specimen at the time, I now have little doubt it was a Snow-Bunting.

LAND-BIRD (size of Thrush).—Dec. 4th. One seen on board s.s. 'Numidian' by Dr. Boag, ship's surgeon, about three hundred miles east of Cape Race, Newfoundland. Clear weather after fog. Dr. Boag also informs me he saw another next day (5th) struggling in water by ship's side.

LAND-BIRD (size of Lark).—Dec. 7th. One seen on board s.s. 'Californian,' eleven miles south of Cape Race, Newfoundland, by Mr. Mackey, second officer. Moderate E. wind and rain.

LAND-BIRD (size of Corn-Bunting).—Dec. 18th. One alighted on board same steamer forty-eight miles north of Sable Island; it rose and flew aft, and was not seen again.

1900.

LAND-BIRD (small)—Jan. 6th. One seen by third officer of s.s. 'Californian,' ten miles north of Malin Head, Co. Donegal. Wind N., misty rain.

LAND-BIRD (size of Sparrow).—Aug. 25th. One observed on

board for last two days. Last seen in lat. $56^{\circ} 14' N.$, long. $18^{\circ} 42' W.$ Clear after hazy weather.

LAND-BIRDS.—Sept. 10th. Gulf of St. Lawrence. Several small birds like Meadow-Pipits, including one Nuthatch (*Sitta canadensis*), from 10.30 a.m. to dusk. At 4 p.m. we had two hawks, which prevented them from gaining the shore. Each time a bird attempted to leave the ship a hawk swooped down, and obliged it to return and seek security under one of the ship's boats. One hawk, however, succeeded in capturing one.

FALCON (sp. ?).—Oct. 3rd. One seen flying about ship at 6.5 p.m., one hundred and six miles east of Belle Isle. Clear weather.

THRUSH (small).—Oct. 4th. Gulf of St. Lawrence. Two seen flying about and alighting at intervals. Hazy weather.

LAND-BIRD (small).—Oct. 15th. Gulf of St. Lawrence. One seen flying about ship during eight to twelve morning watch. Light W.S.W. wind, overcast.

SNOW-BUNTING (*Plectrophenax nivalis*).—Oct. 16th. Nine seen two hundred miles east of Belle Isle. Moderate wind, cloudy and overcast. 17th. One caught at 1 a.m., lat. $53^{\circ} 48' N.$, long. $47^{\circ} 08'$; 4 p.m., five still on board; 11 p.m., two caught. One lived in the steerage, feeding on bread-crumbs, till we arrived in the Mersey (22nd). 20th. One at 3.40 p.m., ninety-five miles from land.

JACKDAW (*Corvus monedula*).—Oct. 20th. One very much weather-beaten settled on ship at 3.40 p.m., when we were one hundred and ninety-five miles from the Irish coast. Moderate S.E. wind and drizzling rain. 29th. Another seen resting on ship, lat. $56^{\circ} 21' N.$, long. $17^{\circ} 35' W.$ It was about ship at sunset, and it probably remained till daylight. Moderate N.E. breeze, clear and cloudy weather.

CARRION-CROW (*C. corone*).—Oct. 20th. One seen at same time as the first Jackdaw. It remained on board all night, and did not leave until we arrived well inside Tory Island, Co. Donegal.

1901.

LAND-BIRD (size of Common Sparrow).—May 21st. One alighted on board at 10 a.m., when we were five miles off Cape Race, Newfoundland, and remained about ship till 4.20 p.m.

Carried eastward ninety miles. Fine weather, horizon slightly hazy.

FALCON (sp. ?).—May 21st. One caught on board 132 miles east of Cape Race. This specimen was secured by a passenger, and brought to Liverpool alive. Oct. 8th. Another (sp. ?) flew past us when we were 117 miles east of Belle Isle. Gentle N.E. wind and foggy weather.

LAND-BIRD (small).—Sept. 21st. One settled on board when 167 miles north-east of Belmullet, Co. Mayo, the nearest land. October, two observed by Mr. Roberts, purser of s.s. 'Corinthian,' when off Belle Isle, and two seen (October) by same observer on homeward passage off Belle Isle.

SNOW-BUNTINGS (*Plectrophenax nivalis*).—Sept. 24th. Flight of twenty settled on ship, lat. $54^{\circ} 38' N.$, long. $44^{\circ} 13' W.$, and two of which were caught later; strong W. to W.N.W. winds and cloudy weather. 25th. Two remained with us till within seventy miles of Belle Isle; moderate N.N.W. gale and overcast weather. Oct. 8th. One settled on ship at 9.45 a.m., eighty-eight miles north-east of Belle Isle; one caught and another seen 106 miles further east: the captured specimen lived till next day. 10th. Twelve with us from daylight, lat. $55^{\circ} 45' N.$, long. $35^{\circ} 37' W.$, to lat. $56^{\circ} 15' N.$, long. $31^{\circ} 13' W.$ 11th. Four at daylight, lat. $56^{\circ} 06' N.$, long. $25^{\circ} 50' W.$, one remaining till dusk, lat. $56^{\circ} 06' N.$, long. $21^{\circ} 24' W.$ 12th. One with us to-day, probably one of the same birds we had yesterday. Mr. Roberts tells me he observed two on s.s. 'Corinthian' when off Belle Isle in October.

GOLDCREST (*Regulus cristatus*).—Oct. 10th. One at 5.25 p.m., lat. $56^{\circ} 15' N.$, long. $31^{\circ} 13' W.$ I have already recorded this occurrence.*

LAND-BIRD (size of Song-Thrush).—Oct. 25th. One alighted on board three miles north-east of Innistrahull; fresh W.S.W. wind, overcast, squally weather.

LAND-BIRD (small).—Nov. 1st. Gulf of St. Lawrence. One seen resting on ship by Capt. Vipond between 8 and 9 a.m.; light W. wind, fine weather, with distant haze.

1902.

HAWK (sp. ?).—March 30th. Bay of Fundy. One settled

* 'Zoologist,' 1901, p. 423.

on mast at 9.50 a.m. for a few minutes. Aug. 29th. Gulf of St. Lawrence. Another (sp. ?) seen by Capt. Imrie of s.s. 'Orcadian' from noon till 1.30 p.m. Fine clear weather, moderate W. wind.

AMERICAN "ROBIN" (*Turdus migratorius*).—March 30th. Bay of Fundy. One seen by our pilot.

LAND-BIRD (small).—April 26th. One seen by Mr. Cook, chief officer, at 7 a.m., 150 miles from the Irish coast.

POLOVER (Dotterel ?).—April 26th, 5.2 p.m. One flying about and keeping with us for an hour, lat. $54^{\circ} 48' N.$, long. $18^{\circ} 44' W.$ It made several attempts to leave, flying with the wind, but returned, uttering a call-note each time. It was not seen to settle on ship.

SAVANNAH SPARROW (*Passerculus sandwichensis*).—May 2nd. Gulf of St. Lawrence. One caught by one of our officers at 1 a.m. while resting, when we were abeam of the Bird Rocks. Moderate S.S.E. wind and overcast.

SWALLOW (*Hirundo rustica*).—May 30th. About twenty miles west of Tory Island, Co. Donegal. Three flying about and resting at times from 4.30 p.m. till midnight. Strong, following E. wind.

WHEATEAR (*Saxicola œnanthe*).—May 31st. One seen between 11 a.m. and noon, and still about at 4.15 p.m., lat. $55^{\circ} 07' N.$, long. $16^{\circ} 20' W.$

BARN-SWALLOW (*Hirundo erythrogastra*).—June 3rd. One seen between 6 and 7 p.m., and caught at 10.15 p.m., lat. $45^{\circ} 33' N.$, long. $47^{\circ} 40' W.$ Early morning hazy, rest of day clear; wind veering from S.W. to N.W.

LINCOLN'S SONG-SPARROW (*Melospiza lincolni*).—June 3rd. One first observed at 11.30 a.m., lat. $49^{\circ} 51' N.$, long. $45^{\circ} 39' W.$, and killed about an hour later.

LAND-BIRD (small).—Aug. 29th. Gulf of St. Lawrence. One observed on board s.s. 'Orcadian' by Capt. Imrie. It kept with the ship for about an hour. Clear, moderate W. wind.

SNOW-BUNTING (*Plectrophenax nivalis*).—Oct. 2nd. One seen at 2.30 p.m., lat. $54^{\circ} 54' N.$, long. $42^{\circ} 09' W.$, by Mr. Gourlay, second officer. Fresh easterly winds, with hazy weather. Steamer has just emerged from continued spell of fog extending from Belle Isle eastward. 4th. Capt. Imrie writes me that about a dozen settled on his ship while passing through the straits of

* Probably the *P. sandwichensis savanna* (Wilson); cf. Ridgway, 'Birds North. and Middle Amer.' vol. i. p. 192.—Ed.

Belle Isle, and remained on board, but decreasing in number till lat. $56^{\circ} 00' N.$, long. $81^{\circ} 00' W.$ was reached.

LAND-BIRD (small).—Nov. 4th. One seen by Mr. Towers, fourth officer, at 2.35 p.m., lat. $54^{\circ} 50' N.$, long. $48^{\circ} 12' W.$

LAND-BIRD (small).—Nov. 5th. One with us for about two hours from lat. $56^{\circ} 34' N.$, long. $84^{\circ} 58' W.$; moderate S. breeze.

SNIBE (sp. ?).—Nov. 6th. One first seen at 1 p.m., lat. $56^{\circ} 02' N.$, long. $85^{\circ} 00' W.$; it kept with us for about two hours. Fresh N.N.E. breeze, clear cold weather.

LAND-BIRD (size of Song-Thrush).—Nov. 8th. One observed by Mr. Cook, chief officer, at 10 a.m., lat. $56^{\circ} 14' N.$, long. $15^{\circ} 24' W.$

1908.

AMERICAN "ROBIN" (*Turdus migratorius*).—April 19th. Twenty-five miles south-east of Halifax, Nova Scotia, two seen following ship for short time; foggy weather, with rain. June 15th. Mr. Cahill, purser of s.s. 'Peruvian,' tells me one alighted on board his steamer when 700 miles east of St. John, Newfoundland, and remained on board for about a day. Another record referring to this species has unfortunately been mislaid.

MEADOW-PIBIT (*Anthus pratensis*).—April 27th, 3.10 p.m. Two with us from lat. $54^{\circ} 20' N.$, long. $17^{\circ} 17' W.$ One of them disappeared down a ventilator at 7 p.m., and was not seen again. The other remained on board till we arrived in Liverpool (29th), having been with us thirty hours, and carried eastward over 400 miles.

LAND-BIRDS (small).—June 18th. Sixteen miles south-east of Cape Ray, Newfoundland; few about ship. Fresh N.N.E. breeze and overcast.

WARBLER (sp. ?).—June 18th. Gulf of St. Lawrence, twenty-four miles north-east of Bird Rocks. A steerage passenger gave me this specimen, which he found in an exhausted condition on deck. It only lived a short time, and I preserved the skin, which still awaits identification.

SNOW-BUNTINGS (*Plectrophenax nivalis*).—July 16th. Dr. Lees, surgeon, tells me one came on board the s.s. 'Pomeranian' when 400 miles east of Belle Isle. Oct. 13th, seventy miles east of Belle Isle, one seen flying about ship.

SWIFT (sp. ?).—July 17th. Twenty-four miles west of

Tory Island, Co. Donegal, one seen at sunset flying about ship for ten minutes.

LAND-BIRDS (small).—July 22nd. Eighty-seven miles east of Belle Isle, three settled on ship. Weather clearing after dense fog.

RED-BREASTED NUTHATCH (*Sitta canadensis*).—Aug. 3rd. Gulf of St. Lawrence. We had a very tame example on board, which rested some time on a passenger's shoulder. Gentle N.W. breeze and clear weather.

WHITE-WINGED CROSSBILL (*Loxia leucoptera*).—Aug. 3rd. Gulf of St. Lawrence. One of our crew gave me this specimen, which he caught at 3.30 p.m. West breeze, clear.

SWALLOW (*Hirundo rustica*).—Aug. 22nd. Flight numbering about 150 settled on ship, lat. $56^{\circ} 19' N.$, long. $18^{\circ} 50' W.$, and remained all night. Two were subsequently found dead, and kept for me in the cold storage, but unfortunately the position where they were found was not noted. Fresh W. breeze, fine clear weather.

HAWK (sp. ?).—Sept. 8th. One killed on board 185 miles east of Belle Isle; moderate E. breeze, clear, but overcast. Oct. 16th. One (sp. ?) with us from 4.30 p.m., lat. $56^{\circ} 24' N.$, long. $24^{\circ} 47' W.$, to 4.50 p.m., when it was disturbed by one of our crew.

WHEATEAR (*Saxicola œnanthe*).—Sept. 26th. One young example killed at 9.30 a.m., lat. $56^{\circ} 12' N.$, long. $15^{\circ} 20' W.$; it was first noticed at 6 a.m. 27th. Another observed flying about ship, lat. $56^{\circ} 38' N.$, long. $26^{\circ} 38' W.$, for five minutes. It settled on a wire-rope over bridge for a moment, and then disappeared.

MYRTLE WARBLER (*Dendroica coronata*).—Oct. 1st. River St. Lawrence above Rimouski; one caught at midnight. Foggy weather.

LAND-BIRDS (size of Snow-Bunting).—Oct. 13th, two miles south of Belle Isle, flight of about twenty going eastward; S.E. breeze, clear.

LAND-BIRDS (small).—Oct. 14th. One seen at 9.54 a.m., lat. $53^{\circ} 54' N.$, long. $47^{\circ} 04' W.$; two crossed ship's bow at 12.10 p.m. Wind N.W. all day, clear weather.

LAND-BIRDS (small).—Nov. 16th. Gulf of St. Lawrence. One seen during 4 to 8 a.m. watch; four at 12.10 p.m. crossed bow, going south.

It is to be hoped that others engaged on North Atlantic vessels will record such specimens as they may happen to meet. If each ship or steamer recorded all such occurrences as take place during a year, it would furnish valuable material towards our knowledge of migration, and we would be able to form an idea of the number of birds yearly lost in this ocean. Probably nearly all land-birds which have reached this country from the American continent have availed themselves largely of vessels coming this way, and a series of records would show how far they have received assisted passages.

Before concluding, I wish to record my best thanks to Capt. Vipond of R.M.S. 'Tunisian' for calling my attention to several specimens, and to Mr. E. Cook, chief officer, for making out and verifying positions and distances. Mr. A. R. Nichols, of the Dublin Museum, has very kindly examined and named some specimens.

NOTES AND QUERIES.

AVES.

Time of Song in Cirl-Bunting.—In reading a note on the autumn songs of the Cirl-Bunting and Dipper by Mr. Swainson (*ante*, p. 78), I thought the dates on which I heard the Cirl-Bunting singing in 1902 might perhaps be of interest. The songs occurred at Aberystwyth, with the exception of that heard on Aug. 4th, which was in Dorsetshire. Dates:—April 30th, June 10th, July 5th, July 10th (near New Quay, Cardigan), Aug. 4th (Dorset), Nov. 2nd, Nov. 5th, Dec. 12th.—K. M. ANGUS (2, Park Street, Lapwing Lane, Didsbury, Manchester).

Two Rook's Eggs and one Moorhen's Egg in the same Nest.—On Easter Monday (April 4th), in company with Mr. G. V. Clarke and Mr. C. B. Ticehurst, I again (by kind permission of the owner, Major Sir Archibald Lamb) visited the fine rookery at Beauport, near Battle, Sussex. This rookery is remarkable for the fact that seven or eight pairs of Rooks have for some years past built their nests in the Portugal laurels under the high trees in the rookery. Close by is a small pool of water, formerly surrounded by reeds and brambles, and in this snug retreat a pair of Moorhens were accustomed to annually nest and rear their young. Some three or four years ago the reeds and brambles were all cleared away, and since that time the Moorhen has always deposited her eggs in one of the low-placed Rooks' nests, taking possession of the nest as soon as it was finished, the Rooks, strange to say, not in any way resenting the intrusion (*cf.* 'Zoologist,' 1902, p. 279). This year the Rooks for some reason or other have destroyed all the old nests in the Portugal laurels with the exception of two, which were occupied last year, and are placed on the same branch, about 18 ft. from the ground, one close above the other, at the top of a large Portugal laurel. Mr. G. V. Clarke went up to these nests, and found that the lower one contained six Moorhen's eggs, and the upper nest had in it two Rook's eggs and one Moorhen's egg.—THOMAS PARKIN (Fairseat, High Wickham, Hastings).

Honey-Buzzard (*Pernis apivorus*).—One morning about the middle of June last, I saw a gipsy woman in the street with a large brown bird

dangling from her finger by a string attached to its beak. On inquiry, I found she wished to dispose of it, and she assured me it was worth a shilling or two to eat. Asked where or how she obtained it, all the information I could elicit was that it was given to her "old man" by a keeper. Whether either of the persons named knew what it was, I know not, but evidently the woman herself was in "blissful ignorance" of the "Protection Act," or she would have been more circumspect in exhibiting her prize. On closer acquaintance with the bird, I saw it was *Pernis apivorus*, but very unlike any of the few specimens I had previously had the pleasure of inspecting. Its plumage was an almost uniform clove-brown, with lighter shadings, caused by the edges of the feathers presenting a paler hue; throat whitish, with brown streaks; sides of the head inclining to grey, especially the scale-like feathers covering the lores, and on the breast were several small and very irregular patches of white, and its long and graceful tail was very prettily barred with two shades of brown. This appearance I supposed indicated a more or less immature condition, but it measured 23 in. long, its weight was one pound ten ounces, and its eyes were a bright yellow, which seemed to point to a more advanced age. On dissection it proved to be a female, with the ovary very undeveloped; the inference to be drawn therefrom is that it was not nesting. In its stomach were a good-sized earthworm, several whitish-looking grubs, and other insect remains; but undoubtedly its last meal had been the contents of a Thrush's nest, as the throat and "crop" were full of the black-spotted blue shells, and what they had previously contained of that songster, the plumage of the head and upper parts of the Buzzard being somewhat tarnished by the moisture exuding from its beak. Its legs were very dirty, as if it had been "scratching" in some soft earth, and near one of its ear-coverts was firmly fixed—robust and ruddy—one of those disgusting looking ticks, such as is often seen attached to Fallow Deer.—G. B. CORBIN (Ringwood, Hants).

Variety of Kestrel (*Falco tinnunculus*) and its Parasites.—From time to time I have seen a large number of Kestrels in various states of plumage, but in November last I saw one—a female—somewhat different to any of my previous experience, in that its whole plumage, usually of a reddish fawn colour, was particularly light—of a pale buff hue suffused with pearl-grey—which made the broad dark marking upon the back and wing-coverts stand out most conspicuously, and the deeply white edges of the primaries caused those feathers to look much blacker than usual; in fact, the general appearance of the specimen at once attracted the attention of anyone interested in such matters. On

handling it I saw it was infested with a number of the largest parasites I have ever found upon any bird; and they were exceedingly active, running about one's hands in a most disagreeable fashion. I, of course, do not wish to infer that the large number of these parasites and their unusual proportions had the least to do with the peculiar colour of the bird—most probably not—but their presence was at least remarkable. I secured a few of them for a microscopical friend, who, if this note should meet his eye, will perhaps tell us something about them.—G. B. CORBIN (Ringwood, Hants).

Bittern in the County Waterford.—A very fine Common Bittern (*Botaurus stellaris*) was shot within a mile from here on Feb. 5th last. The farmer who killed it brought it to me, and kindly made me a present of it. It has gone for preservation to Messrs. Williams & Son. Mr. Williams says it is a male. He also says that he could not see anything in its stomach. Mr. Ussher has many interesting observations on the Bittern in his 'Birds of Ireland,' particularly with regard to the time of its occurrence. Out of one hundred and five instances noted, it appears that December is the month in which the greatest number have been obtained. In 'British Birds,' by W. H. Hudson, there is a fine coloured plate of the Bittern by the celebrated bird-artist, A. Thorburn. It is, however, doubtful whether it is as true to nature as the plate by Frohawk in 'British Birds,' by various authors, vol. iv. Most observers say the bird during the day remains with bill erect, and pointing upwards. The latter is the way in which it is drawn by Frohawk. This is the first occasion in which I have seen this really beautiful bird in the flesh.—WILLIAM W. FLEMYNG (Coolfin, Portlaw, Co. Waterford).

Abundance of Coot (*Fulica atra*) in South Hants.—Some ten years ago I called attention to the then decreasing numbers of Coot frequenting this part of Hants, but during the past autumn and winter their extraordinary abundance was of almost daily comment. One man, who had spent some thirty or more years in pursuits upon the Avon, said he never saw them so abundant, even in the old days when they nested commonly on the river, and the abundance seems to be wholly due to migration, as comparatively few birds were reared in the vicinity, although during the past few seasons a gradual increase of the species has taken place. I understand a similar abundance was noticed in East Dorset, and one thousand birds were reported to have been killed in one day's shooting. There are still an unusual number in this neighbourhood, although so many were killed, but whether they will stay to nest remains to be seen.—G. B. CORBIN (Ringwood, Hants).

Wildfowl on the Hampshire Avon during Winter of 1903-04.—The year 1903 will be long remembered for the continued rains, and, in this neighbourhood, consequent floods resulting therefrom. Much the greater part of past year, and far into 1904, the low-lying lands near the Avon were under water, so that a very small proportion of grass was obtainable for hay, and even the grazing in some parts was almost nil, much to the annoyance and loss of the farming community. This condition of things continuing through the whole winter, may have had the effect of bringing up from the sea more Salmon than usual to the formerly prolific gravelly spawning-beds of the Avon, now, alas! few and far between, for the muddy and uncleansed state of the river has no doubt helped to decrease the production and existence of both Salmon and Trout, if not others of the same class of fish, although a general decrease has taken place in many places throughout the country, where everything advisable has been done for the well-being of the finny tribes. The flooded meadows presented a most attractive site to the various wildfowl, who, taking advantage of the state of things, visited the locality in unusual numbers; but, from a sportsman's point of view, the past winter was anything but "good" as to numbers "bagged," as wildfowl on an open meadow are very different to be approached than where dense osier and artificial barriers screen the gunner. I have before noticed that when the conditions are similar with regard to flood, there are usually a large number of Teal, and the past winter has not been an exception, a flock of some three hundred or four hundred birds having been frequently seen, but, as far as I could learn, comparatively few killed. Wild Ducks were very common. Wigeon were not so abundant as they are some seasons, but large numbers were heard at night passing to and fro; whilst Tufted Duck, Pochard, Golden-eye, Shoveler, and Pintail—mostly immature birds—were not particularly scarce, and I knew of at least three Gadwall having been killed. Upon one estate bordering the river only one day's shooting was obtainable, and that with difficulty, throughout the season, but three or four guns accounted for the following bag, *viz.* Wild Duck, 132; Teal, 115; Wigeon, 10; Shoveler, 5; Tufted Duck, 2; Pochard, 2; Coot, 186; Moorhen, 7; Snipe, 8. Further down the river much heavier bags were made, and I believe little or no hand-rearing of birds was done last year. I am sorry to say, amongst the abundance of birds, no Goosander or Smew seem to have visited their old haunts; I heard of one *Mergus*, but from description of its size, &c., I suspect it was a young female Red-breasted Merganser (*Mergus serrator*), but I did not see it. A few Geese were seen, described as

small and dark—probably Brent—but I did not hear of any being killed in the locality. Several of the Bittern (*Botaurus stellaris*) were observed, and, although I knew of two of this handsome species having been shot, I knew of several still frequenting the vicinity after March 1st, when the shooting ceased. There must have been quite a number upon the water from Salisbury to Christchurch, as I am certain they were not the same birds I heard of from different localities, and is it not a recognized habit of the Bittern not to wander far when it has found a suitable feeding-ground? A friend of mine, who attended those who were “cripple-hunting” the day after the “shoot” I have mentioned, told me that from a large reed-covered island in mid-stream no fewer than three Bitterns were flushed, and two of them hovered over and around the dog in a most peculiar manner, and, to use his words, “if it had been the right time of year, I should have thought a nest or young were near, as the birds seemed to take very little notice of our near approach.” The proprietor of the estate—all honour to him—had given orders that if any Bitterns were seen they were not to be molested, and the birds seem to have taken advantage of the protection afforded them, for on the return of the men they were still flying around the spot they had chosen. Beside the species already enumerated, the Little Grebe (*Podiceps fluviatilis*), which had become somewhat scarce, appeared in some numbers, and their sharp little note was frequently heard—oftener, indeed, than the birds were seen.—G. B. CORBIN (Ringwood, Hants).

Ornithological Notes from Aberdeen—February and March.—Lapwings (*Vanellus cristatus*) appeared on Feb. 24th, while the Sky-Lark (*Alauda arvensis*) commenced to sing at the same date. A subsequent abnormal feature, owing to the very stormy nature of the weather, was the presence of a flock of Snowflakes (*Plectrophenax nivalis*); while the Great Curlew (*Numenius arquata*) was seen on March 11th. The Pied Wagtail (*Motacilla lugubris*) appeared on March 12th, Starlings (*Sturnus vulgaris*) on March 12th, and the Redshank (*Totanus calidris*) was heard on March 18th. Grey and Yellow Wagtail (*Motacilla melanope*) on March 20th, two being in company; they are rather before their usual time, and probably are not numerous at this date. Pied Wagtails are common, and seem abundant this season here. The Green-billed Gull (*Larus canus*) made its appearance inland on March 30th.—WILLIAM WILSON (Alford, Aberdeen, N.B.).

Oviposition in Birds.—Some few weeks back I purchased Professor Coues's ‘Field and General Ornithology,’ and noticed that on p. 330 the distinguished author states: “The egg traverses the passage small

end foremost, like a round wedge, with obvious reference to ease of parturition." I should have accepted this very natural deduction of the process of egg-laying as indisputable had it not been for the fact that some eight years ago I was much exercised in my own mind regarding the subject, and made a number of observations thereon. Possessing a number of hens, and noticing they always stood up in the nest just previous to dropping their eggs, I used to slip under them a small tin vessel, in which I had previously put some clay worked up in water to the consistency of soft butter; the egg was always embedded "big" end downwards. I also had nesting-boxes fixed at a height of about five feet nine inches from the ground, and, on noticing a hen about to deposit her egg, I placed my hand under her *crissum*, and was thus enabled to watch the presentation of the egg, which was invariably "blunt" end first. And surely, considering that in nature it is ever "unity in variety," it must be so; mammalian births, when normal, are head ones, and the larger end of an egg contains the head of the chick.—G. H. PADDOCK (Mill Bank, Wellington, Salop).

Old or Local Name.—The Tydie, which Drayton mentions in the passage quoted by Mr. Aplin (*ante*, p. 117), is probably the Titmouse. Halliwell ('Dictionary of Archaic and Provincial Words') identifies the Tydie of Drayton with the Tydif or Tidif of Chaucer ("Legend of Good Women," 194; "Squire's Tale," 648); and the Tydif or Tidif of Chaucer is both by Skinner ('Etymologicon Anglicanum') and Skeat ('Glossarial Index to the Student's Chaucer') identified with the Titmouse. The name Tidife appears in Swainson ('Provincial Names,' 84) as a variant for the Blue Titmouse. Some of the spring notes of the Blue Titmouse deserve the epithet "delicate."—J. R. V. MARCHANT (Harrow).

PISCES.

Montagu's Sucker at Scarborough.—While poking about in rock-pools in the South Bay at Scarborough, on Feb. 24th, I found, under stones, two examples of Montagu's Sucker (*Liparis montagui*). Again, on the north shore, on March 6th, I found two other specimens. The fish is apparently not uncommon, for I am sure I have seen it before, but did not recognize the distinction between it and the Common Sea-Snail. It does not appear to have been recorded for this part of the coast, and is not mentioned in Clarke and Roebuck's 'Vertebrate Fauna of Yorkshire.'—W. J. CLARKE (44, Huntriss Row, Scarborough).

[This fish is included in Dr. Johnston's List of Berwick Fishes.—Ed.]

NOTICES OF NEW BOOKS.

Blood Immunity and Blood Relationship. By GEORGE H. F. NUTTALL, M.A., M.D., &c. Including Original Researches by G. S. GRAHAM-SMITH, M.A., M.B., &c., and T. S. P. STRANGEWAYS, M.A., M.R.C.S. Cambridge: at the University Press.

THIS book is of the most profound importance to evolutionists. Owing to the "imperfection of the geological record" the question of the inter-relationship among animals has been largely answered by the evidence derived from the similarities of structure in existing forms. To those of the present generation who have followed advanced evolutionary discussions, it will be remembered that the controversy once largely centred on the zoological position that man held in comparison with other animals; and that Huxley separated the Primates into Anthropoidæ (Man), Simioidæ (Apes), and Lemuridæ (Semi-Apes); whilst to-day the usual method is to place Man and Apes in one Order—the Anthropoidea. Darwin, as is well known to all who take any interest in the question, apart from similarities of structure, directed attention in his 'Descent of Man' to the wonderful evidence afforded by the study of "embryonic development." The investigation of blood-relationship is the latest discovery in our growing knowledge of the method, or rather journey, of animal evolution. As Dr. Nuttall has already elsewhere remarked, with regard to results obtained with the Anthropoidea—which applies also to other groups of animals—a common property has persisted in the bloods of certain groups of animals "throughout the ages which have elapsed during their evolution from a common ancestor, and this in spite of differences of food and habits of life." We have already referred in these pages (Zool. 1902, p. 38) to Friedenthal's experimental proof of blood-relationship between Man and the Anthropoid Apes. We now read that Landois, in 1875, established, by his experiments in blood-transfusion, that

where the blood transfused emanated from a closely related species, no ill-effects were observed to follow its transfusion, this being the case, for instance, when transfusion was practised between the Dog and Wolf, Horse and Donkey, Hare and Rabbit.

In the general summary of the results of 16,000 Precipitin-Tests, conducted by Dr. Nuttall and detailed in this volume, we are told that "these tests were conducted by means of antisera for Man (825 tests), Chimpanzee (47 tests), Ourang (81 tests), *Cercopithecus* (788 tests). Maximum reactions were only obtained with bloods of Primates. The degrees of reaction obtained indicate a close relationship between the *Hominidæ* and *Simiidæ*, a more distant relationship with the *Cercopithecidæ*, the bloods of *Cebidæ* and *Hapalidæ* giving still smaller reactions than the last." All four antisera failed to produce reactions with the two bloods of *Lemuridæ* tested, except when sufficiently powerful to also produce reactions with other mammalian bloods. "From this we may conclude that the Lemurs properly belong to an Order separate from the other Primates." It will thus be seen that these results are corroborative to general views on Anthro-poidean descent derived from other facts and advocated on other lines. This study of blood-relationship in animals in a comparative sense recalls the method used in Comparative Philology and Comparative Theology, and may carry us very far indeed.

In thus calling attention to the dominant zoological trend of this book, as can be only done in these pages, we must not let it be suggested that we are dealing with a volume of theoretical tendency. On the contrary, it is a very technical work indeed, fully explanatory of the method of study and experiment pursued, of terminology employed, and lavish in tabular demonstration of results, to which our space forbids adequate recognition. It is another of the many standard zoological contributions made by the University Press of Cambridge.

A Naturalist in the Guianas. By EUGÈNE ANDRÉ, F.R.G.S.,
F.Z.S., &c. Smith, Elder & Co.

MR. ANDRÉ has explored and written on a region which possesses the greatest interest to all naturalists; it has been made classical by Humboldt, and Mr. Rodway has described its

botanical features 'In the Guiana Forest.' This book, interesting as it is, is unfortunately the story of a failure: a catastrophe on the upper rivers destroyed collections, notes, photographs, and all that might have made a notable zoological expedition. As it is, this ascent of the Caura River to within five degrees of the Equator is a considerable exploit, and its narrative is full of the charm that appertains to a natural history expedition. If we do not receive many new zoological facts—as would doubtless have been the case had the misfortune not occurred—the book teems with impressions that a naturalist can really appreciate as material of no little value. Mr. André possesses that absolutely indispensable habit of mind in a traveller which can adapt itself to a primitive ethic, and procure the esteem and confidence of very mixed followers; this has enabled him to learn and tell us much of the social life and views of the scattered people who inhabit the banks of these rivers, and to render the volume of considerable ethnological interest. We are made familiar with many habits of the Tapir, and there are many ornithological observations. Mr. André on one occasion allows himself to theorise, a practice, once considered, as to be only used with the greatest caution, but one now generally extolled, and almost demanded. He writes:—"The bright scarlet or yellow breasts of the Trogons appear to have been specially designed for attracting the flies and other insects on which these birds subsist. What is more likely than that an insect in search of food should mistake the patch of red adorning the collared Trogon for the crimson flower of the rose of the forest, as the natives call the *Brownea*?"

We trust the author will yet succeed in making another expedition, and on that occasion reach his goal, "the distant villages on the Parime Mountains."

The Life-History of British Lizards, and their Local Distribution in the British Isles. By GERALD R. LEIGHTON, M.D., F.R.S.E. Edinburgh: George A. Morton. London: Simpkin, Marshall & Co., Ltd.

Two years ago Dr. Leighton published a book entitled 'British Serpents,' which was noticed in these pages; he has now given us a companion volume on 'British Lizards,' which will doubtless be received with equal favour by all interested in

our British fauna. It is very nicely illustrated, and written on the lines of his previous volume; while the author has paid so much attention to these animals that he is able to give us a very adequate information on their habits and local distribution. On the last subject, in reference to the Sand-Lizard (*Lacerta agilis*), we read: "It has been stated to occur in Berkshire, but the evidence is not good." We think, however, that the testimony of Capt. S. S. Flower (Zool. 1901, p. 430) is conclusive. A specimen was caught in the neighbourhood of Wellington College, Berkshire (1886), was deposited in the London Zoological Gardens, and is enumerated in the Society's 'List Vert. Animals,' 9th ed. p. 594 (1896).

To such an excellent publication we have no wish to be critical, but it is probable that one paragraph in the introduction will be imperfectly understood for want of greater precision in its composition. Dr. Leighton is discussing the operation of describing a new species, and writes:—"He would begin, perhaps, by stating the locality in which he found the specimen, the only locality in which it was at the time known to occur. This statement is the *Geographical Distribution* or *Zoogeography* of the animal, and is one aspect of animal description. It is, in other words, its distribution *in Space*, as far as is known." We would suggest that the locality is but a habitat, or the habitat in which the species was first found, and that it is only when the species is known to occur nowhere else, or when its other habitats are discovered, that any contribution has been made to *Geographical Distribution* or *Zoogeography*, not *in space*, but on the surface of this planet. We feel sure that Dr. Leighton will accept this suggestion in the spirit in which it is offered, and that it in no way detracts from the recognition of an excellent and welcome addition to a knowledge of our insular fauna.

Index Faunæ Novæ Zealandiæ. Edited by Capt. F. W. HUTTON,
F.R.S. Dulau & Co.

THIS volume will prove of no inconsiderable value to those naturalists who may desire, in a non-special sense, to obtain a general view of the New Zealand fauna. In some orders the lists are brought up to date, and the synonymical corrections of later authors assimilated; in some others, especially in one

group of insects, these notes seem to have been ignored, and, to take the Cicadas for example, more descriptive names are recorded than species really exist, as has been pointed out years ago. But, as Capt. Hutton remarks in the Preface: "The list—as its name implies—is an index only. . . . Also, it is only a record, not a revision." The Introduction is a most interesting contribution to the zoology of New Zealand. The historical section details the visits of well-known naturalists since the time of Capt. Cook's first voyage. Capt. Hutton states again and proves the thesis that New Zealand is not an oceanic island, and to account for the various elements in its fauna "it is necessary to assume the existence of a former continent, either in the Antarctic regions or in the Pacific." The theory of submerged continents is often deprecated, but it throws light on many biological problems, and affords an apparent—frequently the only—explanation to many riddles in zoo-geography.

New Zealand Neuroptera. By G. V. HUDSON, F.E.S.
West, Newman & Co.

MR. HUDSON, who has done much in adding to our knowledge of the entomology of New Zealand, has devoted this volume to the order Neuroptera, in which he has included the Odonata (Dragonflies). The principal work done in the description of these insects has been accomplished from time to time by our countryman, Mr. McLachlan, whose descriptions are generally reproduced. The special value of this publication is in its account of the habits and life-histories of many of the species enumerated, which comprise "some of the most important and conspicuous neuropterous insects" inhabiting the rivers, streams, and lakes of New Zealand. Another element in unique information is an appendix on the insect-food of Trout in that country. Eleven coloured plates produced by the process of chromolithography add considerably to the value of a very useful book.

EDITORIAL GLEANINGS.

WE were much indebted to the Secretary of the Society of Arts for advanced proofs of a lecture delivered last year before his Society by Mr. E. North Buxton, on the Preservation of Big Game in Africa. Unfortunately our space has not enabled us previously to make use of this most interesting material, and we now seize the first opportunity of publishing adequate extracts from the same :—

“Of course, man, the destroyer, has always been at his work, but his power has enormously increased, and should be tempered by mercy. If you compare the weapons of old with modern arms of precision, you will understand the ever-increasing rate at which the depletion of life goes on. What was the primitive way? I call an eye-witness of one hundred years ago :—‘By means of signals from natives posted on high, an immense concourse of men and dogs were speedily assembled near the deep and bushy ravine in which the Elephants had taken refuge. The clamour of the naked hunters, reverberated by the precipices, became tremendous. I was frequently constrained to tremble for the safety of the pursuers whilst witnessing their fearless advances towards the huge and irritated victims, seeing that their slender lance constituted the whole of their armour. To see them, in a state of perfect nudity, boldly proceeding to within reach of one of these powerful brutes, could not but give rise to the most serious apprehensions. Three out of the number were at length brought to the ground, and several others severely speared.’

“You will understand that from such a contest there were plenty of survivors. Now skip thirty years, and listen to this by way of comparison. By that time the power of the rifle had begun to be appreciated, and the favourite weapon was a two-groove rifle, and a belted spherical bullet :—‘I crawled in and came upon a kind of backwater from the main river, 150 yards long by 50 wide, with high banks, especially the one opposite me, on which sat dear old — blazing away right merrily. “What is it?” I shouted. “Look at those breasts,” he replied. Bang! “There, again.” The pool was alive with monstrous heads, and, though this was the first time I had seen the Hippopotamus in the flesh, there was no mistaking him. I opened fire at once from my side, at heads which showed for a second above water. Nothing came of it. Though the Hippopotamus were hit

every time, not one of them seemed to die. No results of the thirty or forty shots that had been fired, and yet the animals were within twenty or twenty-five yards of us. "Have you killed any, old fellow?" I shouted, and the answer came back to me, "No; but I have hit all I fired at." The evening was closing in. One Hippopotamus floated up dead on ——'s side. Next morning, however, on the surface lay fourteen huge bodies.'

"Now come to quite recent times. When in Vienna the other day, I saw, at the taxidermist's, the bag of a sportsman just returned from Somaliland. Among other things there were seventy heads of Soemmering's Gazelle. What can one man want with seventy specimens? But the remarkable thing about them was that nearly the whole were females or immature males. To anyone knowing the habits of this species, which is to feed in large herds on the open plain, where they may be readily approached to within three or four hundred yards, it was perfectly evident that these had been obtained by shooting into the brown at about that distance—a very easy thing with a modern small-bore rifle, but hideously destructive and cruel.

"It is the invention of smokeless powder and small-bore bullets which marks this latest advance in destruction. Their enormous speed and penetration and absence of recoil make fun-shooting easy, even to a beginner; while the lightness and cheapness of cartridges tempt the novice to carry a number, and to fire them away at long ranges. Why, it has revolutionized war, and enabled a small and backward people to hold at bay a powerful empire. What wonder if it gives the greedy sportsman an undue advantage.

"I am here to-night to try and focus and unite the growing public sentiment in favour of the restriction of the energies of that class of sportsmen whose frenzy and ignorance have been responsible for such terrible destruction. I cannot do better, I think, than concentrate your attention for a few minutes on the marvellously rich fauna of South Africa a century ago, and compare it with the state of things at the present day.

"Here is an old calf-bound book, given to me by my grandfather fifty-four years ago, and which had lain for a similar period on the family bookshelf. I may be excused for reverting to it, as I imbibed from it the first love of the wilderness. It is a translation of the travels of M. Vaillant, a Frenchman, in 1780. He trekked out from the Cape, and thus describes what he saw in the near neighbourhood:— 'In the space of four leagues,' he says, 'we had on all sides very near us Gazelles, Bontibocks, Bubales, with numbers of Zebras, Ostriches, &c. My Dogs eagerly pursued these creatures, who mingled as they

fled, and altogether formed one vast herd, but the moment I had called off my Dogs, and they thought themselves out of danger, each different species composed a separate band, and kept at a certain distance from each other. Had it not been for my Dogs, I could have shot numbers of them from my waggons, for they were very tame, and seemed pleased to gaze on us.'

"He also notices the Blue Buck, which has now passed for ever, and immense herds of Buffaloes and Elephants, 'so amazingly numerous that we thought it inadvisable to dispute their passage—my camp, animals, and carriages would have been pulverized in a moment.' Even at that period the unnecessary slaughter of wild animals had excited attention. The Swede, Sparrman, wrote, in 1786, of 'sportsmen who merely for the pleasure of shooting are guilty of wasting the treasures of nature in a most unjustifiable manner, and thus spoil their own sport as well as that of others. For when,' he says, 'they make a hunting expedition, they seldom or ever return from the pursuit of a herd of game before they have made great havoc among them, though the carcasses are afterwards left to rot on the ground.'

"It was, however, well into the nineteenth century before the worst slaughter began. From year to year improved communications, the repute of those who had gone before, and better weapons, tempted fresh adventurers into the wilderness. Gordon Cumming was one of the pioneers. In my youth I regarded him as a hero, as did many others. I have somewhat altered my opinion. Here are specimens of his practice taken at random:—'In the evening I shot a lovely Fawn and a big Pallah. I wounded a White Rhinoceros, but did not follow it, and in returning to camp started an Ostrich off her nest. It contained twenty eggs, which I directed the Bechuanas to bring to camp. As we held up the side of the river, I killed a very fine old Black Rhinoceros, and, cutting off his horns, rode home (that is, leaving to waste meat enough to feed a village). In the course of the day I saw the fresh spoor of about twenty varieties of large game, and most of the animals themselves, namely, Elephant, Black, White, and Long-horned Rhinoceros, Hippopotamus, Camel-Leopard, Buffalo, Wildebeest, Zebra, Waterbuck, Sassayly, Koodoo, Pallah, Springbuck, Boar, Dinker, Steinbuck, Lion. Besides the game which I have noted, the following are not uncommon: Eland, Oryx, Roan, Sable, Antelope, Hartebeest, Klipspringer, and others.'

"The above list, of course, by no means exhausts the fauna of South Africa, probably at that time the richest of the world. At least forty species of great game may be found recorded. In recording the death of his fiftieth bull Elephant, he adds the words, 'not to mention

numbers lost,' as if that were something to his credit. Indeed, it would seem that the numbers lost were almost equal to those secured.

"Thirty years later most of the Cape Colony was denuded of game, but Oswell, Livingstone, and others still found vast herds beyond the Orange River. Near the Matopo River, Oswell describes: 'Seven different kinds of animals within view, some, especially the Quaggas and Buffaloes, in large herds, Springbucks, Hartebeest, Gnus, &c., filling in the picture; together there could not have been less than three hundred.' Of these the Quaggas, or Mountain Zebra—a most graceful animal—are completely extinct. Here is an account of another of the beasts which have perished; the Borili, or 'sour-tempered one,' as the Kaffirs called him—the White Rhinoceros: 'Poor, stupid, old fellow,' he says; 'too quiet, as a rule, though, when thoroughly upset, reckless; he was just the very thing for young gunners to try their prentice hand on.' You see young gunners must have something to blood themselves upon which is too clumsy to get away, just as you draw the teeth of rats when you are entering a young terrier to them.

"A much more valuable world's asset at this time than the Rhinoceros or Hippopotamus were the Elephants. Oswell, in 1850, describes seeing, near Lake Gnami, four hundred Elephants standing drowsily in the shade of the detached clumps of mimosa trees as far as the eye could reach in a fairly open country. 'There was nothing but Elephants. I do not mean in serried masses, but in small separate groups.'

"But the sad story of Elephant slaughter during the nineteenth century should be examined a little more in detail. Not only has a valuable and productive asset been thrown away, but the possible use of the Elephant as a friend and servant of man been sacrificed. To what purpose was this waste? The herds were abundant throughout Cape Colony at the end of the eighteenth century, when Barrow, a secretary to the Governor, records a herd of four hundred having been seen in the neighbourhood shortly before. It is probable that up to then, and perhaps for twenty years later, the Elephants suffered no great diminution except from traditional methods—pitfalls and spears—of the natives. But by 1880 they had thinned out, and the ivory-hunters had to go further afield. When the Boers crossed the Orange River they opened out a vast ivory-bearing territory, and great numbers of hunters took to Elephant hunting as a profitable profession. Who can blame them? They had to live, and a rich field lay open to the bold pioneer who feared neither savage nor wild beast. If blame must be allotted, it is to the rulers who recked not of the slaughter going on.

The heyday of the hunters lasted for fifty years. In 1886, Captain Harris found hundreds of Elephants in the Magaliesberg (close to Pretoria), where a sterner kind of hunting has lately familiarized us with those pastures. The next move took these brave wanderers to the Zambesi, and far to the west. At an ever-increasing rate the inroads on the herds continued, until what drought or pestilence or native persecution had never effected, the modern rifle has completed, and now south of the Zambesi scarcely a single herd remains. Only a few miserable hunted remnants, just as I remember in 1884 in America, the last solitary wanderers of the Bison were being shot down by cowboys, their very rarity making them ten times as valuable as a trophy. One slight exception must be mentioned. Owing to the foresight of a few individuals, a small sanctuary was established in the Kynsna Forest, near the coast in Cape Colony, which was perhaps the forerunner of all the game-reserves now existing. The pity of it is that such an experiment was not repeated in many a fair range of mountains in Mashonaland, the Orange River State, and the Transvaal. There were not wanting among the Boer farmers enlightened men who did what they could to preserve some of the disappearing species of Antelope on their own farms, as, for instance, the White-tailed Gnu. It is to be feared that the rough work which accompanied the drives of De Wet have left but a miserable remnant, even if this species is not entirely extinguished. I rejoice to know that under Lord Milner's enlightened rule several reserves have now been established in those States and in Cape Colony, so that something may be saved. It is a suggestive fact that the chief Lobengula had a reserve for Elephants, in which it was death for anyone to hunt, and another for Hippopotamus. When that chief went down it was white men who instantly devoured the whole. It is singular that this savage potentate should have had more foresight than the civilized beings who ousted him.

“Unhappily the same story is being repeated as regards Elephants in Central Africa; notably in the upper waters of the Congo the destruction proceeds apace. The method of the Belgian is to squeeze the orange dry at the earliest possible moment. But everywhere the hand of man is against the Elephant. From their wandering habits it is to be feared these animals derive but little protection from the smaller reserves. The International Congress, which assembled in London in 1898 to consider this question, agreed upon certain recommendations to their respective Governments, but these appear to have been chiefly honoured in the breach except by ourselves.

“Coming further north, I have known of one Englishman who destroyed thirty of the small remnant of Elephants in the British

Protectorate of Somaliland. These were all females or immature males. It is not surprising that they have now disappeared from that protectorate. They are rapidly diminishing in those regions of Abyssinia which adjoin it, and, it is to be feared, in the Soudan also. One more quotation on this part of the subject will be sufficient to account for this disappearance. This time it is a French newspaper which celebrates the prowess of a certain count. It is headed, 'Four Elephants in Four Minutes,' and, as it was accompanied by a photograph, it was easy to see they were all cows or calves.

"By way of indicating the diminution even in recent years, I have tried, from such returns as I could get access to, to arrive at the figures of the exportation of ivory from various African colonies, and selected what appeared to be most important in this respect. It will be seen that in these cases, at any rate, there is a steady decrease. From the Cape we find the value of this export in 1889 was £2495, in 1898 it was £1086. In British Central Africa the value exported diminished from £18,252 in 1895 to £548 in 1902. From Zanzibar, in 1891, ivory to the value of £544,818 was exported; seven years later it was reduced to £112,914. From the Congo Portuguese territory an export of 10,982 kilog. was soon reduced to 1600 kilog. From German East African possessions the value of exported ivory in 1892 was 2,439,000 marks; five years later it was only 1,495,000 marks. Only in the Congo Free State the supply seems to be at present maintained, but I fear by methods which will only too surely bring an end. There is reason to believe that a feverish pressure is maintained from Brussels on the officials, and by them on the unfortunate natives. Notwithstanding the international prohibition, scrivelloes—that is, small tusks, valuable for billiard-balls—still come into the market.

"But I have said enough of the deplorable prodigalities of the past. It is to be hoped that this empire, whatever others may do, has sown its wild oats, and will husband its resources for the future. Under the instigation of the Foreign Office every British protectorate in Africa now has a series of ordinances for the preservation of wild animals and birds. They are mainly framed on the same model, but with some differences to suit the varying conditions. Certain specified areas are declared to be game-reserves. Licences must be taken out for a considerable payment in the case of strangers, and a much lower one for public officers or settlers. In most of them certain species of the larger game are altogether protected. Of the remaining animals, the licence specifies how many of each may be killed. As regards the commoner species, they are generally divided into two categories; of the larger and slow-breeding animals, as a rule, only two are allowed

to each sportsman, while of the commoner kinds, such as Lesser Antelopes, ten may be killed. Heavy fines are enacted for offences against these regulations. Heads, horns, and skins are not allowed to be exported. Every licence-holder is required to keep a register of the animals killed by him, and to submit this to the resident officer at the expiration of his licence, or on leaving the territory. Any Elephant's tusk weighing less than eleven pounds, if found in the sportsman's possession, and all cow-ivory, is confiscated. The use of dynamite or poison for the taking of fish is forbidden. Now these regulations are all good, and, provided they are effectually enforced, they should go far, if not to prevent the diminution of the game, at least to save the species from extermination. Of these regulations, by far the most important which can be adopted by the executive government of any territory as a practical measure for the preservation of species is the constitution of an adequate sanctuary.

"Next in importance to the establishment of game-reserves, I consider the provision which is now to be found in all sets of regulations for the provinces of Central Africa, but not, I fear, in the South African colonies, namely, the obligation upon every person taking out a licence to furnish, on its expiration, a return of the game which he has killed, specifying the number and sex of each species. This condition should be imposed upon all sportsmen without distinction, and is valuable for two reasons. One is the moral effect on the careless sportsman, who is certain to acquire some sense of responsibility when he bears in mind the necessity of setting down in black and white, for official inspection, the result of every successful shot. The other reason is that these returns may—and, I hope, will—be collected from the various colonies and protectorates under the Foreign Office and Colonial Office, and issued as a parliamentary paper. In the hands of an intelligent naturalist, it will serve as a most valuable comparison from year to year of the relative abundance or scarcity of the species. I regret to say that to my knowledge these returns are not always demanded from sportsmen. When their value is recognized, I am confident that a stricter enforcement of the rules will be general.

"Some of the officers concerned have hardly realized the importance of insisting on these returns; even one or two omissions vitiate the combined total, and naturally lead to laxity in other cases. The real sportsman should welcome this rule, while the inexperienced one ought to be taught self-restraint.

"I venture also to urge on the authorities that these returns should show how many licences have been taken out in each class, and if any proceedings have been taken against offenders, and, if so, with what

result. While on this point I wish to urge that the responsibility of instituting such proceedings should not rest with the game-officer when he is quite a junior official, but should be undertaken by the chief officer in the protectorate or province.

"The division of game into various categories—the 'royal list' comprising the animals of such rarity that they may not be shot at all; the larger animals and slow breeders, such as the Greater Koodoo, Rhinoceros, Elephant, and Roan Antelopes, of which only two may be killed, and the commoner Antelopes, of which a larger number is allowed—has already proved invaluable in many cases. The Government in each colony or protectorate should take into consideration from time to time the expediency of adding to this list species which have become rare, or removing others which no longer require this exceptional provision. The value of this provision is illustrated in the case of the Elands and Buffalo in British East Africa. These noble game had become very rare there four years ago. Now, owing to the special protection which they have received, they have to some extent recovered their numbers or immigrated, and considerable herds have been seen this year by sportsmen. The last measure of protection which I desire to emphasize is the prohibition of the export of skins. It must never be forgotten that it was the hide-hunters who were mainly responsible for the destruction of the Buffalo on the prairies of America.

"In conclusion, may I ask all those interested to bear in mind there are certain classes of animals in special danger, and who should be therefore specially guarded. They are:—

"(1.) Those having a very limited habitat, such as the Greater Koodoo or the White-eared Cob on the White Nile.

"(2.) Those animals which pasture on open plains, and which, owing to their conspicuous position, and to the power and range of the modern rifle, are subject to a new danger.

"(3.) The larger mammals, because they also are conspicuous and easily pursued, and especially on account of their slow breeding."

THE ZOOLOGIST

No. 755.—May, 1904.

THE BIRDS OF NORTH KENT.

BY THOMAS HEPBURN.

UNDER the description of North Kent I would include the tract of land which might be roughly delineated as being bound on the west by a line drawn north and south through Woolwich, on the south by a line drawn east and west through Rochester, and having its remaining boundaries formed by the tidal waters of the Thames and Medway. Considered physically, this district may be divided into marshland and upland, the marshes bordering both estuaries, and the upland, or higher ground, running between them in a fairly continuous range, broken only by the valleys of the Cray and Darent, until it merges with a southward trend into the North Downs.

In considering the bird-life of this district it almost naturally falls into three divisions—those birds frequenting the foreshore, those found on the marshland, and those resorting to the higher ground. These divisions of course overlap, but they will appeal to anyone who is familiar with the country in its ornithological aspects.

Possibly there is no part of the coast of Kent which is less visited by the general public than this, for the estuaries of the Thames and Medway are associated in most people's minds chiefly with the idea of mud, and the flat grazing lands or marsh, bounded almost continuously on the seaward side by a river-

wall, are no doubt lacking in picturesque qualities. And, as a matter of fact, it is perfectly true that at low tide, in both estuaries, there is an expanse of mud and ooze which is far larger in extent than the waters of the then comparatively small rivers, hardly discernible from the shore. But to the observer of bird-life it is scarcely necessary to point out the ornithological possibilities which the stretches of ooze present, possibilities which are often in some measure fulfilled, and would no doubt be more frequently accomplished were it not for the considerable traffic which passes up and down both rivers. And after all, the gently rising upland, with its well-cultivated fields, separated by hedges and scattered elms, is typically English scenery; while the flat marshland has a charm for some men which it is difficult to describe, and perhaps not altogether easy to account for.

As already stated, a river-wall divides the land and water for the greater part of the coast-line, although there are a few places where the upland rises direct from the shore. It would be interesting to know how long these walls have been built, and the land thus enclosed, reclaimed from the sea. A walscot is levied on the farmers of the district for keeping the walls in repair, the authority for doing so being claimed under an Act passed in the reign of Henry VIII. There seems reason to suppose that the walls nearer London owed their origin to the Romans, and it is presumable that the extension eastward of these defences against the sea was gradual, and spread over a considerable period of time, some characteristics of the marshland also bearing out this theory. Where the margin of the river shelves steeply down, the outer side of the wall is faced with stones, in the cracks and crannies of which Rats are numerous, and in places a few Rabbits are to be seen. In more than one part of this coast-line there are quite respectable stretches of sandy beach, which extend from the wall with a gradual slope until they merge into the ooze of the bed of the river, or sometimes stretch out into long shingly flats reaching some distance into the tideway, and forming pleasant hunting-grounds for a few Oystercatchers (*Hamatopus ostralegus*), occasionally to be seen there in the autumn and winter months. In other parts there are large areas of salt-marsh, the largest being in the Medway. These "saltings" are curious places, and possibly give one some idea of what the land

now enclosed within the walls was like before they were built. The larger saltings are all intersected and cut up by tidal creeks, and they appear at high tide like so many flat-topped islands, covered with a greyish green vegetation, consisting chiefly of some species of sea-heath. At the seaward edge they almost invariably drop sheer down to the mud, the height varying from two or three to ten or fifteen feet. The cement trade is having some effect on the character of the saltings, especially in the Medway. The clay of which they are formed is a necessary material in the manufacture of cement, and large quantities are annually dug out at low tide, and taken away by barge. This, assisted by miniature landslips taking place occasionally at the spots where the men are digging, has had the effect of forming several large open basins in the middle of the saltings.

Along the outer edge of some of the narrower strips of salt-marsh there are thrown up, in a more or less irregular way, banks of shells and sand, which stand rather higher than the saltings themselves, and at high tide will be dry, while the salting is partly submerged. Some of the banks of shells are also covered at the highest spring tides, but there are a few which can easily be distinguished by the strength of vegetation growing on them, which have evidently not had salt-water over them for many years, and the growth of green is fast concealing the sand and shells of which they are formed. A curious feature about these banks is that some of them consist entirely of the shells of the Edible Cocker. There is more than one place in the district where there are (or were, for sometimes the tide washes them away again) deposits of Cocker-shells several feet thick, without a particle of sand or anything else mixed with them. But, as a rule, these banks, locally known as "shelly beaches," consist of broken shells, sand, and a little shingle. The Cocker is the predominant shell, but Mussels sometimes occur in thick beds of smaller area, and there are also always to be seen considerable numbers of a small pink and white, or yellow and white, bivalve (*Scrobicularia alba*), a rather delicate white or yellowish bivalve (*S. piperata*), a large coarse white or brownish bivalve (*Mya arenaria*), and also small Oyster-shells and numbers of Periwinkles. Living specimens of all these shells can be

picked up near the edge of the mud, and live Periwinkles and Mussels are numerous about the stones, where can also be found a few small specimens of the Oyster. It may be fair to assume, that these deposits of dead Cockle-shells point to there having been large colonies of the same mollusc, in such positions, in the bed of the rivers, and that their dead shells were washed up by the tide on to the places where the banks are formed.

Those banks of shells and sand which are deposited on the outer edge of the existing saltings, in the cases where the saltings they are on present a high perpendicular edge to the tide, present a problem to be solved as to how they originally got there. At the present day the ordinary tides may only lap over the perpendicular edge on to the level of the marsh; a spring tide may just cover the salting itself with a few inches of water, while a spring tide, in conjunction with a strong wind blowing up the river, may make the water wash the top of the lowest shelly beaches. It seems therefore almost certain that since these deposits were made the relative positions of land and water have been altered by a gradual upheaval of the land, and this idea is in some measure confirmed by the fact, already mentioned, of certain portions of the shelly beaches becoming rapidly overgrown with vegetation. I venture also to think that the perpendicular edges of these saltings is a sort of object-lesson in miniature, showing how cliffs are formed by the action of water on the edge of gradually rising land. A more difficult thing to account for, is why the level of the marsh inside the wall should be lower by several feet than the level of the salt-marsh outside the wall, this being certainly the case nearly everywhere.

The wall itself forms a very convenient roadway from which to carry on observations, as from its top can be commanded a complete survey of the marshland on the one hand, and the mud-flats or estuaries on the other; and it also, upon occasions, forms a useful screen, under cover of which birds can be approached nearer, without alarming them, than would otherwise be the case. And there are many birds which become associated with the vicinity of these walls, though not, properly speaking, shore-birds; such as the Wheatear (*Saxicola cinanthe*), which is fairly common in the eastern portion of the district during spring and summer, a few pairs also nesting in

holes near the wall, but which is seldom to be seen any distance away from it; it, in fact, uses the wall as a vantage-ground, flitting along in front of the intruder. A fully-fledged family, last June, were still making use of their nesting-hole as a retreat, long after they were able to fly. In the autumn family parties of old birds and the young of the year are very numerous. The Meadow-Pipit (*Anthus pratensis*) is another bird which seems to have a strong liking for the margins of the saltings, being more common in the winter months, but many pairs nest in the long coarse grass and vegetation which grows on the banks of the wall, and their short song and curious flight in spring time and summer quickly associates itself in one's memory with walks along this coast-line.

The Rock-Pipit (*Anthus obscurus*) is also a common bird in the autumn and winter, but not to be seen except in close proximity to the shore, and, in fact, one might almost say that it keeps religiously to that side of the wall nearest to the tideway. In the winter Linnets (*Linota cannabina*) seem to find food of some sort amongst the vegetation of the saltings which is evidently to their liking, for numerous small parties of these birds are almost always to be seen there. The Hooded Crow (*Corvus cornix*) is a very common bird all through the autumn, winter, and early spring; as also is the Carrion-Crow (*C. corone*), all the year round, in a more inconspicuous way. A walk in winter along the wall will generally disturb more than one party of the first-named birds, and a pair or two of the latter, holding *post-mortems* on various subjects of interest to them amongst the wrack of the tide. The earliest date I have noted of seeing the Hooded Crow in the autumn is Oct. 21st, 1900, and the latest date in spring is April 21st, 1900; but a closer observation than I am able to keep would no doubt give more exceptional dates. It is a common sight to see both the Hooded and Carrion Crow feeding out on the mud-flats, amongst Gulls and other birds, at low tide.

It strikes one rather by surprise to see a Kingfisher (*Alcedo ispida*) flash past on these salt-marshes. Curiously enough, two of my notes of this bird fall within a day of each other in consecutive years—Nov. 16th, 1902, and Nov. 15th, 1903; but I have also several notes of them about the land-marshes at the same time of the year—November and December. Upon one

occasion only—Jan. 31st, 1903—I followed and watched a flock of fifteen Snow-Buntings (*Plectrophenax nivalis*) feeding in the grass on the river wall. When flying away the white feathers in the wings and tail were so conspicuous as to make them appear to be almost entirely white. The note they uttered when flying was something like the twitter of a Greenfinch.

In the winter months there are generally large mobs of Ducks to be seen on the Thames. For the greater part they consist of the Wild Duck (*Anas boschas*), but I have also distinguished at various times the Common Sheld-duck (*Tadorna cornuta*), the Pintail (*Dafila acuta*), the Teal (*Nettion crecca*), the Wigeon (*Mareca penelope*), and occasionally the Common Scoter (*Edemia nigra*) and the Scaup (*Fuligula marila*); and on one occasion (February, 1904) I saw a small mob of Wild Geese flying over from the Thames in the direction of the Medway, but at too great a distance for me to be able to distinguish the species. The Ducks are kept continually on the move by passing craft, and are in consequence wild and shy, and not easy to get near; but, concealed by the wall, I had the good fortune to watch for some time (February, 1904) a large flock of fully two hundred Sheld-duck, with a small flock, on the landward side of them, of about thirty Pintail. They all floated past within a distance of thirty yards (it was high tide at the time), across a little inlet which rejoices in the name of Egypt Bay. The Sheld-ducks were rather noisy, continually uttering a cackling note. One of them noticed my head over the bank, and instantly gave the alarm, with the result that all the mob were soon on the wing, flying out towards the middle of the river.

The Waders are naturally the most common birds to be seen on the mud-flats of these two estuaries. Amongst passing visitors are the Dotterel (*Eudromias morinellus*), and the Turnstone (*Streptilas interpres*), of both of which species one generally sees a few along the margin of the tide during the spring and autumn migrations, the Turnstone more frequently than the Dotterel. The Grey Plover (*Squatarola helvetica*), and, as already mentioned, the Oystercatcher (*Hematopus ostralegus*), are to be seen occasionally during the winter on the mud-flats; the Golden Plover (*Charadrius pluvialis*), although sometimes seen on the shore during the same season, is more common on the upland,

often in company with large flocks of Lapwings (*Vanellus vulgaris*). The Dunlin (*Tringa alpina*) is to be seen in more or less large flocks all the year round, in the spring and summer with the dark band on the breast; and Curlew (*Numenius arquata*) and Whimbrel (*N. phæopus*) are also nearly always to be seen or heard all the year round, either on the mud-flats or saltings, Curlew being more numerous of the two.

Of all the Waders, however, the Redshank (*Totanus calidris*) is the most numerous, and, although distributed all over the marshland during the nesting season, it confines itself almost entirely to the mud-flats and salt-marshes during the autumn and winter. A little manœuvring behind the river wall, will often enable one to watch small flocks of these birds, feeding on the oozy bottom of the creeks, and channels of the saltings. They run rapidly as they feed, occasionally taking short flights, trying to get ahead of each other, continually probing the mud with their bills, not hesitating to run breast-deep into the water, and every few moments uttering a soft low whistle. They are more difficult to approach at high tide, when all but the highest parts of the saltings are submerged. These high places they choose to rest on, and however careful the watcher may be, he will hardly have got his head above the level of the top of the river wall before he is greeted by the shrill alarm-note—a sort of double whistle—of one of these birds, which he will probably see flying straight towards him, as though to investigate, then circling round, often quite close to the water, with rapid and powerful strokes of the wings, sounding its alarm-whistle all the time, and effectually arousing any birds in the near neighbourhood. In a minute or two it will settle on another piece of land, raising its wings straight over its back before folding them into their places; and, after bowing its head two or three times in different directions, it will subside into quietness until disturbed again. This bird has a trick of bowing its head in this way; it will stop in the middle of feeding to do so, the bow being often, but not always, accompanied by a whistle. In a walk through these saltings at low tide, requiring to be done with some circumspection, on account of sticky mud, and creeks which need negotiating, one will surprise many parties of these birds, and Dunlins, feeding along the smaller channels. Their shrill alarm-

notes will often be accompanied by the deeper and more subdued whistle of the Curlews feeding farther out on the flats.

The Ring-Plover (*Ægialitis hiaticula*) is to be seen along the coast all the year round, and nests on the shelly beaches; but of this bird, and its life in the district, more anon.

Of the Tern family, the Lesser Tern (*Sterna minuta*) nests on the shelly beaches, and the Common Tern (*S. fluviatilis*) is to be seen in small numbers during the late summer; and I have one note (Aug. 9th, 1902) of a Black Tern (*Hydrochelidon nigra*), which I watched for some time beating up the Thames about thirty yards from the river-wall.

All six species of British-breeding Gulls frequent the district, and are often to be seen in large mixed flocks in the winter, and in smaller flocks in the summer. The Common Gull (*Larus canus*) and the Black-headed Gull (*L. ridibundus*) are the commonest, the latter scarcer in summer; large flocks of mature Lesser Black-backed Gull (*L. fuscus*) are occasionally to be seen, but the Herring-Gull (*L. argentatus*), the Great Black-backed Gull (*L. marinus*), and the Kittiwake (*Rissa tridactyla*) are not numerous. The mixed flocks of these birds are generally largely composed of immature examples.

I have watched Divers from a distance on the Thames (March, 1904), but too far off to be able to identify them, except that by the light and dark throats it was fairly clear that there were male and female present; probably from their size, as compared to Wild Ducks, amongst which they were swimming and diving, and whom they seemed to be considerably disturbing, they were specimens of the Red-throated Diver (*Colymbus septentrionalis*).

My only acquaintance with the Guillemot (*Uria troile*) in this district consists of a frozen corpse which I found on the landward side of the wall about ten miles up the Thames (Dec. 27th, 1901).

From the foregoing notes it will be seen that the only shore-birds which breed along this coast-line are the Ringed Plover and Lesser Tern. A chance Redshank or Lapwing may occasionally lay its eggs to the seaward side of the wall, but the pasture-lands and the margins of the fleets in the so-called marsh are their stronghold.

The Ringed Plover's year in this district might well be

divided into halves—the one from the beginning of September to the end of the following March, when its gregarious habits prevail, and it is to be seen in flocks of various sizes round the coast; the other from the beginning of April to the end of August, when it frequents the shelly beaches in numerous pairs, and is occupied with the work of bringing up its young. Any day in the autumn or winter one may notice small parties of these birds searching for food over the mud-flats, generally in the more open parts of the coast, but also occasionally along the narrow creeks running through the saltings. They often join forces with flocks of Dunlin, and, as a rule, in these mixed flocks the Dunlin predominates; but upon many occasions one will see very large flocks consisting entirely of Ringed Plovers. It is to be found at this season up the Thames to within six miles of Gravesend, and up the Medway to within four miles of Rochester, but it is more numerous in those parts of the coast which reach nearest to the open sea.

Towards the end of March, however, a walk along the shelly beaches, which the bird does not frequent much during the winter months, will show that they are already beginning to seriously think of the business of nesting. They will be seen at this time of early spring in numbers, playing on the beaches, although not yet separated into pairs; the male birds indulge in fantastic twisting flights, accompanying their movements with a rolling whistle, which might well be described as a rapid repetition of their ordinary call-note, with a slurring of one note into another. This whistling song is not heard except during the breeding season, and then only while the bird is in flight. At this early date the birds are more numerous than later on, but all through the season there are a certain number of non-breeding birds present about the beaches; and during this season also one often sees them feeding on the land, and by the edges of the fleets, a thing which one never notices in the winter months.

The earliest date on which I have found nests with eggs in them is May 10th. On that date, in 1908, I found four nests containing respectively one, two, three, and four eggs. In the case of the nest containing four eggs, laying would probably have commenced at least a week earlier; and in the case of several nests I found hatching out towards the end of May of the same

year, the first eggs must have been laid during the first week in the month ; and with several nests found in 1902, calculating back from the date of hatching out, the commencement of laying would also be the first week in May. Other nests found, in which the first egg was laid towards the middle of June, were probably second broods, though this it is hardly possible to prove.

The laying of eggs in individual nests seems to take place at irregular periods. Thus a nest found containing one egg on May 10th, 1903, had only three eggs in it on May 16th. A nest found on June 12th, 1903, with two eggs in it, had the third egg laid on June 14th, and the fourth egg not until June 17th ; but wet and cold weather had intervened in both these cases, and no doubt influenced the birds. The latest date at which I have found fresh eggs was June 28th, 1902, a nest containing four eggs being found on that date, and one being blown to test the freshness proved them to have been quite recently laid.

I have never had sufficient time at my disposal to be able to watch closely the history of one nest right through, but incubation must occupy fully nineteen days, for a nest found on May 31st, 1903, contained as a full clutch only two eggs, which did not hatch out until June 18th ; but, not having had the nest under observation previous to May 31st, I was ignorant as to when the bird began to sit.

It is fair to assume from these notes that the Ringed Plover takes at least a week to lay its clutch of four eggs, the interval between the layings being in some cases as much as three days. Of course the hatching of the eggs is not spread over such a period of time, according to my experience extending only over about twenty-four hours. A nest found on May 31st, 1903, contained four eggs, in which the young birds could be distinctly heard tapping on the shells. Visiting this the next day, I found that two of the chicks had already left the nest, and were nowhere to be seen ; the third chick was crouching near the nest quite strong and lively, and able to run ; while the fourth was still in the nest-hollow, quite wet, having evidently not long got free of its egg-shell, and too weak yet to stand up. Notwithstanding the evident very recent hatching of this chick, I could find no trace of egg-shells near the nest. In another instance, a nest first found on May 31st, 1903, with a full clutch of four eggs, had

one egg hatched out early on June 7th, the other eggs not being then even chipped, nor were they before sun-down on that day. But the next morning there was only one egg left in the nest, which proved to be an infertile one.

I had hoped that this last nest would have given me the opportunity of proving the truth of the statement, sometimes made, that the old bird removes the pieces of egg-shell from the vicinity of the nest when the chicks are hatched. On June 7th, when I found the one chick hatched, as already mentioned, one-half of the egg-shell was lying in the nest-hollow, and the other half close to it. The character of the ground enabled me to conceal myself within fifteen yards of the nest, and so effectually, that the bird was very shortly back on its eggs. It took no notice of either of the pieces of egg-shell. After it had been settled on its eggs a few moments, it stood up in the nest and shuffled the eggs and young bird in what seemed to be a very rough manner with its wings and feet. It then settled down again, and remained quite still, except for keen alert movements of its head, until disturbed by some children coming over the top of the sea-wall. But in the meantime the wind had done what the bird is supposed to do, and the half egg-shell outside the nest was blown to a considerable distance, while the second half still remained in the nest-hollow. Late in the afternoon this other half had also disappeared; and the following morning, when all but one egg were hatched, there were no egg-shells to be seen near. Judging from my own experience of the very breezy spots which these birds choose as nesting sites, it would be scarcely necessary for the old bird to do more than kick the egg-shell out of the nest, when in all probability the wind would do the rest.

The latest date at which I have handled nestlings was Aug. 4th, 1901, when I caught and examined a brood of four, still covered with down, and showing no sign of quill-feathers. In describing the markings of the Ringed Plovers' nestlings in 'The Zoologist,' 1903, p. 222, I was perhaps not quite accurate in saying that there was no sign of the black pectoral band. From numerous examinations of these downy nestlings during the spring of 1908, I would correct this description by saying that there is the commencement of this band in the shape of

two small black patches on each side of the body just where the carpal joint of the wing folds against the breast. Arguing from this, according to the laws usually laid down by evolutionists, we may fairly suppose that at one time the adult Ringed Plover had not the complete black band across its breast, but a broken band, after the fashion of its near relative, the Kentish Plover (*Ægialitis cantiana*); and that, as this condition of marking still shows itself in the first plumage of the young Ringed Plover, the alteration of the plumage of the adult from a broken to the complete pectoral band has taken place at a comparatively recent date—recent from the point of view of the evolutionist. It is interesting in this connection to remember that the adult Kentish Plover has the band incomplete; the nestling Ringed Plover has it incomplete, while the adult has it complete; and the Lapwing, nestling and adult, both have the completed black band. I have referred to all the ornithological works at my disposal as to the plumage of the Ringed Plover in its first year, and they all say it has a brown band across the breast. On August 9th, 1903, I was watching a flock of twenty of these birds, amongst which were two which had *not* a complete band, but small black patches on either side of the breast in the same position as in the case of the nestling, the middle of the breast being white. These two birds had also no black markings on the head, and were therefore certainly birds of that year.

I have kept a record of nineteen nests of these birds found on the shelly beaches during the last three seasons. Out of the nineteen there were two in abnormal positions. One of these was a scratch-out in the earth at the base of the river-wall, and was separated by about one hundred yards of salt-marsh from the beach, the nest-hollow being quite thickly lined with the leaves of the sea-heath growing on the saltings. The other was scratched out by the side of a road, made up of cinders and household refuse, running across one of the saltings. This also was some distance, two hundred yards, from the beach, and the nest-hollow was paved entirely with small pieces of earthenware, evidently picked off the track on which the nest was situated. The remaining seventeen nests were all on the beaches, within a few feet of high-water mark; but five of them were made under the shelter of little bushes of sea-heath—which grows on

the beach in small clumps to the height of about twelve inches—the nest-hollow being so much under the edge of the bush as to be partially concealed and shaded by its stems; the remaining twelve nests were in the open exposed parts of the beach. Of these seventeen nests, I also noticed that seven were distinctly and without doubt paved with small pieces of broken shells, the rest being just bare hollows scratched in the sand. The normal nest therefore would appear to be a bare hollow scratched out in the most exposed portion of the beach. Do both these lined, and partially concealed, nests point to a gradual alteration in the habits of this bird in the direction of a more specialized nest?

The colony of Lesser Terns which I have had under observation now for three successive seasons—it is pleasant to be able to say so—seems to be increasing in numbers. The birds make their appearance in April, being then seen in small parties fishing along the coast and creeks in the vicinity of their nesting ground. The earliest date on which I have a note of them is April 20th, 1902; but I do not give this as the date of their arrival, because my observations have not been continuous enough to fix that date; although during a visit to the beach on April 14th, 1903, I saw no signs of them, and should therefore be inclined to put the date of their arrival as somewhere between April 14th and 20th. They do not congregate on the beaches where they nest until towards the middle of May. On May 20th, 1903, I found them in numbers on their own particular stretch of beach, and I was rather surprised to find two nests with one egg in each: this is the earliest date at which I have found their eggs. From the first start of laying, I am of opinion, that any day one would be able to find fresh eggs, and eggs in all stages of incubation. The only eggs I have taken from this colony have been acquired simply with a view to testing the times of laying. Thus, an egg from a nest containing three, taken on May 26th, 1901, was so hard sat that I could hardly blow it. (This would put the first laying for this nest earlier than May 20th.) At the same date an egg from another nest was perfectly fresh. On June 18th, 1903, I found a single egg which I thought had been laid since a visit on the previous day, and upon blowing it my surmise proved to be correct. On June 28th, 1902, a single egg laid in a nest proved to be quite

freshly laid, as did also an egg apparently laid by chance on the beach. At the same time—June 18th, 1903—I handled nestlings just hatched out; and on June 28th, 1902, I caught nestlings beginning to flutter over the beach which had the primary quills quite long. At such a late date as the end of June it is no criterion of freshness to see only one egg in the nest, as it simply means, in most cases, that the other eggs are hatched and the chicks away. What often has astonished me is how seldom one notices the young nestlings after they have once left the nest-hollow, although there must often be numbers crouching on the beach.

The main colony is crowded on to a piece of beach a hundred yards long; but there are also a few smaller detached colonies, which make the nesting range of the bird stretch for quite two miles along the coast. In the main colony the nests are astonishingly close together, and are often intimately associated with nests of the Ringed Plover. There are so many nests that it is difficult to keep any clear record of them, but in June, 1902, I jotted down a plan of a small part of the beach (about forty yards long by fifteen yards wide), on which I had marked thirteen Lesser Terns' nests, and two Ringed Plovers' nests, all with eggs or young in them. From notes made during that spring I was able to fix the length of incubation at about twenty days, as a nest found and marked on May 26th with two eggs in it, contained two nestlings just hatched on June 15th. From this and foregoing notes one might expect to find young nestlings in the first week of June. The earliest note, however, of nestlings which I have is on June 12th, 1903, on which date I found four nests with young in them. The wet weather had played sad havoc with them, as three of the nestlings were dead. The same cause might account for slow hatching out in one of these nests. This contained one nestling and one egg on June 12th, and the second nestling was not hatched until June 14th, both being in the nest-hollow on that day, the recently hatched one being only three-quarters the size of its elder brother. In 1902, towards the end of June, and fine warm weather, a nest found on the 27th of the month with one chick and two eggs, on the early following morning contained only one egg, both nestlings that were hatched having already left the nest. Some of the young

which I measured as they lay in the nest-hollow (they generally lie quite flat on the ground with the head stretched out in front) were from $2\frac{1}{4}$ in. to $2\frac{1}{2}$ in. long. The colour of the down above is a sandy yellow, stippled with black, forming black streaks. The under side is pure white. The feet and legs are a pale pink flesh-colour, and the beak pinkish horn at the base, and black towards the tip. A bigger nestling caught running on the beach measured $3\frac{1}{2}$ in. long, and had the sandy yellow down of a darker shade, and the legs and feet of a redder pink. Another, measuring 4 in. long, had the primary quills well developed.

A curious feature about some of the nest-hollows made by the Lesser Terns on this beach is that they are most carefully lined with pieces of white Cockle-shell. I have never noticed, either on Dungeness Beach or any other district where I have examined Lesser Terns' nests, the slightest approach to a lining of any sort. And it is only exceptional, I think, even on this beach. A typical nest of this description has the shells spread in a circular patch, somewhat larger than the actual hollow in which the eggs are laid, and heaped up round the edges of the nest, so as almost to form a little circular bank. The measurements of such a nest found on May 26th, 1902, proved the hollow to be $\frac{3}{4}$ in. deep and 4 in. in diameter, while the patch of broken shells measured $5\frac{1}{2}$ in. in diameter; and on the same day I examined two other nests made after the same pattern. Later in the same season I found four nests which were only partly lined with broken shells, giving the idea that the shells had been spilled, as it were, on to one segment of the nest-hollow; and on the same date I found several nests with no shell-lining at all. In one day spent on the beach in 1901 towards the end of May, out of four nests examined, three were lined all over with the broken Cockle-shells. In the spring of 1903, however, there seemed to be a marked scarcity of shell-lined nests, as out of some twenty to thirty nests examined, only two had a shell-lining extending over the edges of the hollow, as described above. The lining of shells is so thick, that in 1903 I could distinctly see the remains of a nest I had marked the previous spring. As may be imagined, a thick patch of white Cockle-shells is quite the reverse of an assistance in concealing the eggs from sight—at any rate, from the sight of a human being.

The number of eggs laid is of course usually two or three, but I have one note of a nest found on June 12th, 1903, with four eggs in it, which showed such strong resemblances to each other as to leave little doubt that they were all laid by the one bird. I have found that the markings of the eggs laid in this colony vary much more than do those of eggs found on Dungeness Beach. In the latter district the majority of the eggs have a sandy ground colour, with both the underlying and surface spots more or less minute, almost approaching in fineness the spots on the eggs of a Ringed Plover; and there is also a variety to be found on Dungeness Beach in which the ground colour is a creamy white, and the spots are nearly black, and almost large enough to be called blotches. This last variety is much more common on the North Kent beaches, but the variations of both the ground colour and the markings show many more grades between the two types. One might almost say that the ground colour ranges from a pale blue, through white, creamy white, and sandy, to a brown, almost as deep as some Gulls' eggs; and the markings from small spots to large blotches, more than half an inch in diameter, similar in character to those often seen on Sandwich Terns' eggs. One abnormally coloured clutch looked remarkably like eggs of the Mistle-Thrush, one of them being of a delicate blue ground colour, with only two spots. I will confess that this clutch found its way into my cabinet.

I have often wondered whether the instinct of these birds is ever at fault as to the positions in which they place their nests with regard to the tide. In one instance I found a nest, on June 1st, 1902, with the bird sitting on three eggs, on a spot which at some time during the following fortnight was swept by the tide, the small piece of beach having been washed right away, leaving the bare clay exposed. When I first found this nest the bird was so keen on returning to its eggs that it settled on them while I was sitting on the beach with a friend in full view, and not fifteen yards distant. It is therefore probable that the eggs were then in a forward state of incubation, and, if so, were possibly hatched out before the tide came over the place. At Easter of 1903 there was a very high spring tide, backed up by a strong easterly wind, when only very narrow strips of the highest parts of the beach were above water. If

there had been such a tide as this during the nesting season, many of the nests on the beach would have been covered. May 10th was the next spring tide, but on that date there were few eggs laid, and there were no signs of the water having been so high as in April. At the spring tide in June the beach was full of nests, but the tide did not reach the level of April, and I was on the beach myself on this occasion, and found that, although the water came within a foot or two of many nests, there were none in danger of being washed away.

The Little Terns are most interesting birds to watch. Their flight is both graceful and powerful. When fishing along the creeks or ditches, they will often come close to a quiet observer. They then fly quite slowly, and every stroke of the wings can be seen to actually lift the bird's body as it propels it forward. Its beak is pointed downwards at right angles to the horizontal centre line of its body, and one can see it turning its head from side to side scanning the water for food. When it catches sight of anything, it will hover like a Kestrel, with rapid wing-beat, and the tail spread wide, assisting it to maintain its stationary position. This hovering seems to serve a double purpose of enabling the bird to make sure that there is something worth plunging for, and also to get itself into the right position with reference to the object it wishes to secure; and I have often seen them work themselves *backwards* several inches when hovering in this way. As soon as it has decided that there is something worth catching, it drops head first, with half-closed wings, perpendicularly into the water, the head and shoulders disappearing underneath, and only the tips of the wings and tail showing above the surface. They generally sit on the water for a moment before taking flight again, and occasionally swim about for a minute or two. But, as a rule, they do not waste much time before again beating along over the water.

The beach on which they nest can hardly be passed by in ignorance during the nesting season, for as soon as an intruder comes within a certain distance every bird rises off the beach. The majority fly straight out to sea, but some few come towards the visitor, uttering all the time their chattering call-note. The probabilities being that there are a certain number of birds attached to the colony not engaged in nesting operations, as a

large number always rise in a flock from parts of the beach exposed by the tide, while those sitting on nests rise one by one at intervals from the part of the beach on which the nests are situated. By concealing oneself at a moderate distance, the birds can be watched returning to their nests. First one bird will fly back to the beach, and beat backwards and forwards over it, being joined shortly by many others. A few moments' hovering over certain spots by individual birds will give the observer some inkling of where the birds will eventually settle on their eggs. But there is much hesitation, the hovering being many times repeated, the bird sometimes dropping to within a few inches of the beach, and yet rising again. Then finally one bird, after a moment's hovering, will drop down right into the nest-hollow, just steadying itself with its wings as it reaches the beach, then folding its wings, settles itself on its eggs. One by one others will follow the example of the first, and by degrees the beach will regain comparative quiet. It is almost an unbroken rule for the bird to settle right in the nest-hollow, but on two occasions I have noticed a bird settle far enough away from the nest to entail the necessity of walking a few steps to get on to the eggs. The beach does not remain quiet long, as a good deal of quarrelling takes place amongst the mates of the birds sitting on the eggs as they bring in food. And birds will chase each other all over the beach, often disturbing those on the eggs. Or a Ringed Plover will occasionally come too close to a Tern sitting on its eggs, and either it or its mate will fly at the intruder with angry chattering, and drive it away. Later in the year one may watch the old birds feeding their young ones, and it is noticeable then that both the old and young Terns are fairly active in running over the beach; but not to be compared in this respect with the Ringed Plover. As far as I have been able to make out, but on this point I am not quite certain, the feeding is done by the old bird dropping whatever morsel it is carrying into the young bird's widely opened beak. A large Gull or a Crow passing overhead will be a signal for a number of the birds to dart out and drive it off; and a very lively time it has from the absolutely fearless attacks of its small tormentors until it gets well out of bounds. I cannot imagine that any birds can do much harm to the colony in the way of stealing eggs; but a

large Grass-Snake which I one day found making its way along the beach might be a more dangerous enemy.

By the first week in August the beach itself will be deserted, but feeding along the coast, or sitting on the beaches not far from the nesting sites, the whole colony, young and old, will be found collected into one flock. They are then often seen flying in regular formation, such as is adopted by the Dunlin and Golden Plover. They will also occasionally have associated with them other species of birds. Last year (1903), early in August, I saw a mixed flock consisting of about one hundred and fifty Lesser Terns, thirty or forty Ringed Plovers, as many Dunlin, still with dark breasts, a dozen or more Common Terns, and half a dozen Turnstones. It is at this season that one can get some idea of the number of birds in the colony, and my estimates for the last three years were, approximately, eighty birds in 1901, one hundred to one hundred and twenty in 1902, and one hundred and fifty in 1903.

BIOLOGICAL SUGGESTIONS.

RIVERS AS FACTORS IN ANIMAL DISTRIBUTION.

BY W. L. DISTANT.

(Concluded from p. 133.)

Part II.—DISTRIBUTIVE ACTION.

IF rivers have proved barriers to the distribution of animals in one way, they have also assisted in another manner to the dispersal of much animal life. As Heilprin has well remarked: "In regions like the tropics, which support a luxuriant vegetable growth, and which are subject to periodical overflows, and, consequently, to the uprooting or outwashing action of the inundating waters, it not infrequently happens that islands or 'rafts' of considerable magnitude, consisting mainly of interlaced or matted vegetation—tree-trunks held together by various creepers and climbers, and containing a sufficient quantity of vegetable mould and soil bound together in the roots—are floated down stream into the open sea, where they are at once placed at the mercy of the prevailing oceanic and atmospheric currents."* Many such occurrences have been detailed by competent observers, and have not been confined to the tropics.† We can scarcely over-estimate the amount of animal life contained in this mighty flotsam and jetsam. The northern coast of Spitzbergen is covered with immense accumulations of driftwood, which has been pronounced by botanists to be nearly all Siberian larch, brought by ocean currents from the mouths of the great

* 'Geogr. and Geol. Dist. Animals,' p. 44.

† Similar floating islands are found on lakes. Capt. Gilliss states that before Lake Taguataga in Chili was drained there were in it islands composed of dead plants matted together to a thickness of from four to six feet, and with trees of medium size growing upon them. These islands floated before the wind, "with their trees and browsing cattle" (cf. Marsh, 'Man and Nature,' p. 350, note).

Siberian rivers.* This driftwood is some of that which the Lena and other rivers carry into the sea every spring.† Benkendorf, a young Russian engineer, employed by the Government in a survey of the coast of the mouth of the Lena and Indigirka, was despatched up the latter stream in 1846, and communicated the following account of his experiences in a letter to a friend in Germany:—"In 1846 there was uncommon warm weather in the north of Siberia. Already in May unusual rains poured over the moors and bogs, storms shook the earth, and the streams carried not only ice to the sea, but also large tracts of land, thawed by the masses of warm water fed by the southern rains. . . . The river rolled against us trees, moss, and large masses of peat, so that it was only with great trouble and danger we could proceed."‡ Similar is the action of our own Tweed, when after a week's rain it comes down "in its might, and every tributary stream, transformed for the nonce into a river," swells the mighty flood. "Then timber trees, sawn wood, dead animals, farming implements, even haystacks," come floating down, and the very channel of the river is diverted, sometimes never to return to its ancient course.§ On the floating islets of the Mississippi "young trees take root, and the water-lily or nenuphar displays its yellow flowers; serpents, birds, and the Cayman Alligator come to repose there, and all are sometimes carried to the sea, and engulfed in its waters."|| Not, however, always engulfed, for the sea sometimes casts up more than her dead, an instance of which is recorded by Guilding at the island of St. Vincent: "A noble specimen of the 'Boa Constrictor' was lately conveyed to us by the currents, twisted round the trunk of a large sound cedar tree, which had probably been washed out of the bank of some great South American river, whilst its huge folds hung on the branches, as it waited for its prey. The monster was fortunately destroyed after killing a few sheep."¶ The South

* Cf. Ripley and Dana's 'Amer. Cyclopædia,' vol. ii. p. 77 (1874).

† Cf. Laughton, 'Phys. Geogr. in Relation to prevailing Winds and Currents,' p. 207.

‡ Cf. W. Boyd Dawkins and H. W. Oakley, 'Cassell's Nat. Hist.' vol. ii. p. 289.

§ "The Autobiography of a Salmon," quoted by J. Watson, 'Poachers and Poaching,' p. 165.

|| Cf. Lyell, 'Principles of Geology,' vol. ii. p. 865.

¶ *Ibid.* p. 869.

American travellers Spix and Martius assert that on different occasions they observed "Monkeys, Tiger-cats, Squirrels, Crocodiles, and a variety of birds" carried down the stream of the Amazon on such floating masses, and similar observations have been made by other travellers on the Rio Paraná. It is asserted that no fewer than four Pumas were landed in one night from such rafts in the town of Monte-Video.* Mr. Rodway describes the blocking of the Guiana rivers with the monster arum (*Montrichardia arborescens*), and floating island-grass (*Panicum elephantipes*), which in dry weather, when the water is low, and the stream has little power, "meet in the centre, and close the passage-way for a time, only, however, to be torn away in great masses as the floods come. At such times great patches, fifty feet or more in diameter, are seen floating down-stream, sometimes carrying with them monster Camoudies (*Boa murina*), or other snakes. Sometimes a great tree, whose timber is light enough to float, gets entangled in the grass, and becomes the nucleus of an immense raft, which is continually increasing in size as it gathers up everything that comes floating down the river."†

From the East we frequently read the same story. Lord George Campbell relates that when the 'Challenger' was steering for Humboldt Bay—"For the last two days we have been passing quantities of driftwood, so thick and heavy last night, that we had, for fear of the screw, now and then to stop. . . . All this heavy driftwood must have been swept here by rivers, probably swollen now, as it is the wet season in New Guinea."‡ Floating masses of wood, with upright trees growing on them, were mistaken by Admiral Smyth, in the Philippine Seas, for true islands, until their motion made their real nature apparent. On the coast of Borneo, when sailing for Kuching, Mr. Boyle found "a huge tapong-tree quite eighteen feet in diameter and eighty feet long, hanging and jarring" against the side of the vessel. The same day he saw a "floating island; the phenomenon is not uncommon in tropical latitudes, and its principle of locomotion is found to be simple enough when properly investigated. Some

* Heilprin, 'Geogr. and Geol. Distr. Animals,' p. 44.

† 'In the Guiana Forest,' pp. 107-8.

‡ 'Log Letters from the Challenger,' 2nd edit. p. 272.

giant tree upon a river-bank is carried away by a sudden inundation, and floats upright out to sea, supported by the mass of earth in the clasp of its widespread roots. When the soil melts away the tree is subverted with a crash, the island disappears, and a naked log drifts too and fro upon the waves.”* Mr. Hickson may be quoted for Celebes: “During the heavy rains of 1882 the Manado River brought down vast numbers of mighty forest trees, and many of these must have drifted out to sea with a very considerable crew of Squirrels, Mice, caterpillars, and other animals.”†

The distribution of plants is also largely influenced by the action of rivers, and many species are thus dispersed which would have scarcely any wide distribution by other means. On the banks of rivers and streams, “a portion of the plant-fragments brought by floods and stranded on the mud of calm inlets undergoes decomposition. A larger portion remains fresh and living, sending out roots and vigorous shoots. In the bed of the Danube, in addition to the abundant creeping shoots of the reeds (*Phragmites*), and various sedges, bulrushes (*Scirpus*, *Typha*), broken twigs of *Salix fragilis*, bits of root of the sea-buckthorn (*Hippophae rhamnoides*), and fragments of the rhizomes of *Enanthe phellandrium* and *Acorus calamus*, leafy twigs and stolons of various species of pondweed, water-milfoil, and water-ranunculus (*Potamogeton*, *Myriophyllum*, *Ranunculus aquatilis*) are all distributed in this way. Sometimes these growths settle in places where formerly no specimen of the kind had been seen for miles, and the fact may be easily confirmed that the distribution of their offshoots is actually brought about by flowing water in a very short time to great distances and in great abundance.”‡ In the Malay Peninsula, *Hodgsonia heteroclita* frequents dense thickets on river-banks. It bears very large woody gourds, covered with a grey pubescence. These gourds drop from the plant when ripe, and float in the river. The pubescence prevents them from injury by wet, so much so that a gourd may be plunged in the water and taken out again dry. The seeds, too, are large and woody; they float in water, and are protected from

* ‘Advent. among the Dyaks of Borneo,’ p. 135.

† ‘A Naturalist in North Celebes,’ p. 190.

‡ Kerner and Oliver, ‘Nat. Hist. Plants,’ vol. ii. p. 808.

injury, as the pulp of the fruit is exceedingly oily. "This is an example of modification for dissemination by water."*

Even rivers influence the route of bird migration. Prof. Mosso, from an examination of a map illustrating Palmén's law of bird migration, states "that the birds follow by preference the great river valleys and the shores of sea and ocean. One of the most frequented routes in Europe is the valley of the Rhine as far as Switzerland. It is round the Swiss lakes, indeed, that the greater number of northern birds are found. To go to Africa, they pass the Lake of Geneva and the Mediterranean by the valley of the Rhone. Here the route divides, and the birds reach their destination by either the Italian or the Spanish coast-line."†

Part III.—RIVERS SWAM BY LAND ANIMALS.

BUT though rivers may at the present time—and undoubtedly did in the past—prove a barrier to animal distribution, and especially to that of mammals, still, as might be expected, many mammals and other animals, including some of the least suspected, have from time to time been observed to cross wide and swift rivers, and have moreover apparently inherited a tendency to do so, which has subsequently developed into a somewhat fixed habit. As an example, the Tiger may be adduced as an animal not only known to cross rivers, but even to swim across an arm of the sea, as the Singapore Strait, which is more than a mile in width. According to Mr. Ridley, "they habitually swim over to Singapore, across the Johore Strait, usually by way of the intermediate islands of Pulau Ubin and P. Tekong. They make the passage at night, landing in the early morning. As so much of the coast is mangrove swamp, and the animals do not risk going through the mud, they are only able to cross where the shores are sandy, and thus they

* H. N. Ridley, 'Nat. Science,' vol. viii. p. 188

† 'Fatigue,' pp. 22-8.

have regular starting and landing places.”* The Jaguar (*Felis onca*) has been observed crossing the La Plata River by Lieut. Page.† Paul Fountain states that all the large Cat-like animals readily take to the water, “but it is quite the element of the Jaguar. I have never seen these animals far from the river, and a thickly wooded island in the midst of the stream is their favourite haunt.”‡ In Africa, according to Mr. F. V. Kirby, “Leopards take to water very readily, and swim well. I once saw one swim across a river, a distance of fully thirty yards.”§ In North America the Black Bear was seen by Hearne swimming for hours with widely open mouth, thus catching, almost like a Whale, insects in the water.”||

Elephants are well-known swimmers. Dr. Schweinfurth relates that six Indian ones were sent by the Khedive Ismail from Cairo to the Sudān. They travelled the long distance of two thousand miles uninjured, “swimming the Nile six times.”¶ Sir S. Baker saw Elephants cross the Brahmaputra when the channel was about a mile in width.** Mr. Gould mentions a Kangaroo which swam for two miles through the sea, one mile being against a sharp wind and heavy waves.†† The Guanaco,

* ‘Natural Science,’ vol. vi. p. 89.—The Tiger is, however, absent from Ceylon, and has not crossed the narrow strait which separates that island from the mainland. Mr. Hornaday thus accounts for its absence:—“It certainly was not the width of the strait which hindered its immigration, and the inhabitants of Ceylon have to thank their lucky stars that the two long arms which in reality connect the island and the peninsula are barren wastes of sand instead of being covered with thick jungle. Had there been sufficient vegetation upon them to afford cover for the Tiger, or encourage his migration, there is no doubt that the island would now be infested by these dangerous beasts” (‘Two Years in the Jungle,’ p. 252). Jungle, however, is not an absolute necessity for the Tiger as Mr. Hornaday’s remarks might lead one to suppose. In the Himalayan regions its footprints are sometimes found impressed in the fields of snow, whilst it is also an inhabitant of the plains of Manchuria and the Amoor region, as well as of the plains lying north of the Hindu-Kush.

† Cf. Heilprin, ‘Geogr. and Geol. Distr. Animals,’ p. 42.

‡ ‘The Great Mountains and Forests of S. America,’ p. 68.

§ ‘In Haunts of Wild Game,’ p. 380.

|| Cf. Darwin, ‘Origin of Species,’ 6th edit. p. 141.

¶ Cf. note, ‘Emin Pasha in Central Africa,’ p. 390.

** ‘Wild Beasts and their Ways,’ vol. i. p. 48.

†† Cf. ‘Bush Wanderings of a Naturalist,’ by an Old Bushman, p. 4.

or Wild Llama, as observed by Darwin in Patagonia, is described as readily taking to the water; "several times at Port Valdes they were seen swimming from island to island."* Brehm heard from eye-witnesses that to the American Bison, when migrating, "a stream a mile wide is to them no barrier, scarcely even a hindrance."† The male Moose, in rutting time, swims from island to island, in the lakes and rivers of North America, in pursuit of the females.‡ As our late contributor, the Rev. H. A. Macpherson, affirmed, Deer swim very well, whether in salt water or fresh, and will keep the sea for over an hour if it is calm, and for more than half that time even if it is rough. "Du Fouilloux says he has known of Deer driven to sea by hounds, being taken thirty miles out by fishermen." Pliny credits Stags with swimming thirty leagues.§ The Martindale Stags occasionally swim the breadth of Ulleswater Lake in order to join the hinds in Gowbarrow Park. Stags have also been found to cross from Gowbarrow to the shores of Martindale, but this is an unusual event.|| On the Purus, in South America, Deer swim gracefully and well, both in the river and in the lake. On one occasion Paul Fountain saw two Jaguars attempt to intercept some of them that were swimming towards the bank of the lake. The Deer saw them, and changed their direction, and, though the Jaguars galloped round the lake, the Deer were too quick for them, and escaped.¶

Bates saw a Three-toed Sloth (*Bradypus tridactylus*) swim a river about five hundred yards wide. Even Armadillos "are said to be able to swim well and swiftly."** Dr. Leith Adams states that the Canada Lynx (*Felis canadensis*) is well known to be an expert swimmer, and preys on Trout and small fishes.†† The Mole (*Talpa europæa*) has been seen swimming across the Trent where it is about two hundred yards wide, and the Hedgehog (*Erinaceus europæus*) has been known to swim a pond of

* 'Journal of Researches,' &c., edit. 1890, p. 158.

† 'From North Pole to Equator,' p. 242.

‡ Cf. Gilbert White, 'Nat. Hist. Selborne,' Harting's edit. p. 98.

§ 'Red Deer,' p. 244.

|| *Ibid.* p. 24.

¶ 'The Great Mountains and Forests of S. America,' pp. 81, 82.

** Cf. 'Roy. Nat. Hist.' vol. iii. p. 217.

†† 'Nat. Nile Valley and Malta,' p. 88.

some eighteen or twenty yards from bank to bank.* The Mole has also been described as swimming across a Broadland river, "its little pink snout raised just above the surface."† Mr. Emerson, another Broadland observer, states that "Marsh-mice can swim; and, as the Water-Vole swims faster than a Rat, so the Marsh-Vole swims faster than a Field-Mouse. Pike and Herons sometimes take them on their journeys to and fro 'athwart the deeks.'"‡ According to Brehm, in Siberia migratory Squirrels found the rushing Tchussoveia no obstacle, for all that reached the bank of that rapid mountain river plunged without hesitation into its whirling and seething waters, and swam deeply sunk and with their tails laid across their backs to the opposite bank.§ Lemmings "swim across rivers, and even across broad lakes, arms of the sea, and fjords."|| Campbell says "they swim rivers, and Trout eat them, for I have several times cut freshly-swallowed 'Lemens' and Mice out of Trout which took my flies in the Alten."¶

Yarrell has recorded having seen a Hare voluntarily take to the water, and swim across a harbour a mile wide.** Emerson writes that Hares take to the sea if pressed, as also to the broads and rivers, when the harriers are close upon them.†† Jesse relates, on the authority of an angling friend for whose accuracy he can vouch, that one morning while angling for Trout he suddenly heard a great splash, and found it was caused by a Hare which had jumped from the bank to swim the river. Mr. Marshall, the angler, threw his fly over her, hooked her on the fur of her back, and *comfortably* landed her.‡‡ Mr. Lydekker has even seen a Common Rabbit (*Lepus cuniculus*), when startled by his Dog on the margin of a river, plunge into the water, and reach the opposite bank in safety.§§

* Max Peacock, 'The Naturalist,' 1901, p. 44.

† W. A. Dutt, 'The Norfolk Broadlands,' p. 127.

‡ 'Birds, Beasts, and Fishes of the Norfolk Broadland,' p. 331.

§ 'From North Pole to Equator,' p. 254.

|| *Ibid.* p. 255.

¶ 'Frost and Fire,' vol. i. p. 271.

** Loudon's Mag. Nat. Hist.' vol. v. p. 99.

†† 'Birds, Beasts, and Fishes of the Norfolk Broadland,' p. 329.

‡‡ 'An Angler's Rambles,' p. 19.

§§ 'Roy. Nat. Hist.' vol. iii. p. 198.—R. L. Stevenson, in the South Sea

Most men in a natural condition can swim, but records principally appertain to their feats in the sea. There are some narratives of their fluviatile journeys, and perhaps one of the best to instance is that given by Paul Fountain: "The Indians take long journeys through the forest, swimming the broadest rivers with great facility, setting at naught the danger from lurking Caymans, and simply using a small log of wood as support or float. Some few tribes do use what is called in Guiana a 'wood-skin,' a kind of shallow bark canoe; but this habit seems to be so exceptional and local that at this time I had not heard of it, and supposed all the Indian tribes to be ignorant of the use of canoes."*

We may now leave mammals, and turn our attention to land-birds, apparently most unlikely subjects to develop natatory habits. The instances to be given are very few, but are sufficient to indicate that the practice cannot be considered as unique. Mr. Cronwright Schreiner has known Ostriches to swim some distance down the Great Fish River when it was running fairly strong, and heard on good authority of a cock that was carried a long way down the same river when it was running nearly level with its precipitous banks in the stormy season; he was some hours in the water before he could get out, but he emerged unhurt.† Pheasants will occasionally take to water. A young bird has been seen to swim across a pond about eighteen or nineteen feet wide in following its mother which had flown over the same. A cock Pheasant has been observed to swim across the River Usk where it was thirty yards broad, and running at the rate of four knots an hour. "When wounded and dropped into the water, Pheasants swim with facility, and some instances are on record of their diving beneath the surface and rising at some distance."‡

Islands, has known one of the native Pigs to leap overboard, swim five hundred yards to shore, and return to the house of his original owner ('In the South Seas,' p. 91).

* 'The Great Mountains and Forests of South America,' p. 41.

† 'Zoologist,' ser. 4, vol. i. p. 104.—"Even as a chick the Ostrich is a powerful swimmer."

‡ Cf. Tegetmeier, 'Pheasants, their Nat. Hist. and Pract. Management,' pp. 11, 12.

Most reptiles can swim. Dr. Leighton has recently made some remarks on British species. "It has long been a matter of dispute and doubt whether the British Adder (*Vipera berus*) ever took to the water as a matter of ordinary habit. Most ophiologists denied this, or at any rate had not observed it. Years of observation in English counties had failed to bring forward a single case, but the result of some correspondence indicated that in Scotland the habit was not unusual. Investigations and experiments with Adders in the Scottish Highlands proved that in that district Adders were in the habit of swimming the streams and rivers, a habit which has become incorporated in some of the folklore of the Highlands."* This again indicates that we have a paucity of observations relating to the swimming of many reptiles.

Even insects of non-aquatic habits swim. Mr. Jas. Hudson, in a paper recently read before the Royal Horticultural Society on the cultivation of Water Lilies, states that Aphides are troublesome to Nymphæas, and that these insects appear to have accommodated themselves to the situation, and acquired the art of swimming.

We have only given examples of an animal practice, which is probably of almost universal application when necessity occurs, but which at the same time is one little recorded as regards non-aquatic species. In one sense it exhibits the inheritance of an acquired habit. All mammals can swim, but few persistently exhibit the acquirement. Pursued by enemies, and accidentally immersed or borne away by floods, must have been the experience of many animals, some of which succumbed, while others survived by natatorial capacity. Thus in time, though rivers still remained mighty, they were no longer complete barriers to the dispersal of land animals, and therefore, though the aggregate of a species may be focused on one side of the stream, its migratory representatives may be distributed over a considerable area from the opposite bank.

* British Association Rept., Sect. D. Southport, 1908.

NOTES AND QUERIES.

MAMMALIA.

Pigmy Shrew (*Sorex minutus*) at Rainworth.—A Cat brought one of these little animals into the house a short time back, and from what I hear this is the first time it has been recorded for the county.—J. WHITAKER (Rainworth, Notts).

Colour Variety of the Common Mole (*Talpa europæa*).—I have in my collection a pretty colour variety of the Mole, which I think is worth recording, as it is uncommon. The colour is an iridescent “mouse-grey” (description from Ridgway’s ‘Nomenclature of Colours’). The fur is somewhat coarse, and has not the soft feel of the ordinary Mole. The specimen was taken at Milford, Surrey, in May, 1902.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

Winter Whitening of the Stoat in Britain.—There seems to be some evidence that winter whitening, when it takes place in the Stoat in Britain, is more prevalent amongst females and males of less than average size than amongst large males. If any naturalist can kindly add to the evidence which I already possess upon this point I should be extremely grateful.—GERALD H. BARRETT-HAMILTON (Kilmanock House, Arthurstown, Ireland).

AVES.

Robin nesting in a Tree.—On March 28th last I saw a Robin (*Erithacus rubecula*) carrying nesting materials in the churchyard here, and watched it to its nest, which was in the top of a young cypress tree. The tree is a thick and luxuriant one, about seven feet high, and stands close to the edge of a path, and about fifteen yards from a side door of the church. The nest was in the centre of the top, between the two leading stems, and nearly five feet from the ground. It was well concealed by the thick fronds of the cypress, but fully exposed to the action of the wind, which causes the tree to sway considerably. The nest was completed a few days later, but was unfortunately destroyed before eggs had been laid. The village youngsters search the trees in the churchyard for nests, and it is rarely that one can

escape their prying eyes. I have never before known a Robin to build among the leaves of a tree or bush, in a situation similar to that of a Blackbird's or Greenfinch's nest. Can anyone tell of a similar instance?—ALLAN ELLISON (Watton at Stone, Herts).

[A few years ago a Robin built in a high hedge at the bottom of my garden on the Surrey hills. The egg of a Cuckoo was also deposited in this nest. The Cats which destroyed all the young nesting birds did not spare this interesting family.—ED.]

Crossbill in West Suffolk.—A male Crossbill (*Loxia curvirostra*) was unfortunately shot near Bury St. Edmunds on March 31st by a school-boy gunner, from whom a mutual friend kindly begged it for me. From the *post-mortem* examination I have little doubt but that it was one of a pair of breeding birds. It is in orange-red plumage, with bright yellowish-green feathers appearing here and there, and, having carefully inspected these green feathers with the aid of a powerful glass, they appear to be the beginning of a new plumage rather than the last of an old one. It will be remembered that the male of the pair of Crossbills now exhibited, with their nest and eggs, in the National Collection, which the donor has fully described in this Journal (1889, p. 181), is a yellow-green bird.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

Observations on the nesting of Rooks.—For some days past I have been watching the efforts of a pair of Rooks (*Corvus frugilegus*) to establish a nest in a small plantation situated a few hundred yards from a colony of about forty nests. As soon as the nest is about half-finished, a raiding party, consisting usually of about six Rooks, comes up and demolishes it. Sometimes a single bird will come, and then the aggrieved pair give battle, but on the arrival of reinforcements they retire from the struggle. Another couple started building operations in an adjoining tree, but, curiously enough, the marauders have so far taken no notice of them, though they still continue to harass the original pioneers. I have been speculating as to the cause of the unpopularity of these latter. Are they the leaders of a revolt from the main body, or newcomers into the neighbourhood, or are they a weak couple that can be robbed with impunity? Can any of your readers who have studied the habits of Rooks supply any other explanation? At the time of writing the nest is about half-finished, but a rowdy crew keeps coming up to see how things are going on, and one or two scowling sentinels remain on duty, evidently to report progress.—R. H. RAMSBOTHAM (Elmhurst, Garstang).

Hoopoe at Beachy Head.—A relation of mine, living at Eastbourne, has just sent me the enclosed "cutting"; she went at once to see the bird, but found that it had died soon after capture, and had been sent to be stuffed. If it had not escaped from confinement, it is an interesting occurrence. Bird died twenty-four hours after capture.—D. A. BANNERMAN (Guildford).

"On Thursday, April 21st, 1904, Mr. Marcus Uzielli, a gentleman staying at Granville Hill, was riding on the downs with a friend (Mr. Maurice Stammers), when a strange-looking bird was seen flying slowly near the ground. Mr. Uzielli dismounted, and went in pursuit of the bird, which, being in an evidently distressed state through long exercise on the wing, was soon caught. Inquiry quickly revealed that the bird was a specimen of the Hoopoe (*Upupa epops*), whose appearance in this region is said to be extremely rare. We are informed, in fact, that one has not been caught in Sussex for a good many years. The presumption is that this particular bird had strayed, and had crossed the Channel. The specimen captured by Mr. Uzielli, who hopes to preserve it alive, may be seen at the premises of Mr. Cameron P. Cummings, naturalist, 19, Terminus Road."

Appearance of Cuckoo.—On April 7th last I put up a Cuckoo out of a small bushy hollow on the downs near Swanage, Dorset. The bird was very weak on the wing, and settled again in the next field.—BERNARD B. RIVIERE (Flaxley, 82, Finchley Road, N.W.).

Kestrel (*Falco tinnunculus*) laying in an artificial Nesting-box at Rainworth Lodge.—I have six boxes here for Stock-Doves to breed in. Three are made of poplar trees hollowed out and boarded at each end, a hole being left for the bird to get in; they are placed on the arms of two oak and a sycamore, and bound on with wire; the bark is left on, and they are very attractive to Stock-Doves. All these have at the present time nests in. The other three are simply deal boxes, and in one of these, which is fixed up about 25 ft. high in a Scotch fir, the Kestrel is now nesting. We have noticed them hanging about since February, and lately they have been seen to go into the box, which is about 2 ft. by 18 in. deep. As I passed the tree the other night, I gave it a tap with my stick, when out came the Kestrel. This afternoon (April 28th) it did so again. A long ladder was got, and my son went up and found five eggs in the box, the Stock-Dove nest of last year being used. They are a very beautiful clutch, and having been laid in such a curious place makes them of great interest to us. We have many different birds nesting in boxes here, but this is the first time a Hawk has done so, nor have I ever heard of such a case. The tree stands,

with others, about two hundred and fifty yards from the house, on a bank on the side of the Deer-paddock here.—J. WHITAKER (Rainworth, Notts).

Gadwall in Hants.—It may interest Mr. G. B. Corbin and others who study Hampshire ornithology to know that a number of pinioned Gadwall have been turned out on the Beaulieu Manor, in the hope that these birds may become established in the county in the same way that has been done in Norfolk. I trust that sportsmen on the neighbouring estates will give them a chance. When once seen they are easily recognized on the wing even at some distance, and, if flushed close by, the white speculum is unmistakable.—HEATLEY NOBLE (Temple Combe, Henley-on-Thames).

Kentish Plover (*Ægialitis cantiana*) at Rainworth.—On April 18th my son saw a small Plover running about in a young wheat-field on the side of one of the ponds here, and on getting up to it under the cover of a hedge—which he did within fifteen yards—and focusing his glasses on it, found it was a bird of this species, and, having seen many of them when nesting in Holland, there was no possible mistake. The bird then flew a short distance, uttering its call, which is quite different to the Ringed Plover. It settled again, and began to look for food. He watched it for some time. Again later in the day he saw it, and was for many minutes within easy distance; so he had every opportunity of being quite certain about it. This is a new species for Notts, and it is rather remarkable to have been able to add a new bird and a new animal in one week, but here someone is always on the look-out.—J. WHITAKER (Rainworth, Notts).

Little Gull (*Larus minutus*) on the Mersey.—On Dec. 16th, 1903, my friend the Rev. W. B. Tracy noticed a single Little Gull in winter plumage amongst other Gulls around the Conway.—F. C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

Great Crested Grebe in Richmond Park.—A pair of *Podiceps cristatus*, which I believe have nested on the Penn Ponds, Richmond Park, for the last few years, have arrived again this spring. I first noticed them on the 17th of this month (April). One of the birds is in full summer plumage, the other is still in winter dress. On March 27th I noticed a number of Scaup and Pochards on the Penn Ponds, but they have now left. I heard the Wryneck in Richmond Park on the 17th for the first time this year.—GORDON DALGLISH (29, Larkfield Road, Richmond, Surrey).

Early nesting, &c., of Little Grebe (*Podiceps fluviatilis*).—A river-keeper, upon whose word strict reliance may be placed, has just told me that he saw a nest of the Little Grebe, containing four fresh eggs, on March 10th, which, as far as my experience goes, is a very early date for such an occurrence. A gentleman, when Salmon-fishing a few weeks ago, detected some white object upon a quantity of river-weeds, and on closer acquaintance saw it was the silvery breast of a Grebe, the bird having been choked in its attempt to swallow a Bullhead (*Cottus gobio*). He brought the bird to me with the fish (which was full of spawn) stuck fast in its gullet, supposing such a case unique; but I assured him it was a fact comparatively well known, and that three or four similar instances had come under my own observation. Being the commonest of its class, and a "resident" species, what lover of the feathered tribes but has watched with pleasure the interesting movements of this expert little bird, which, when feeding unmolested, swims and dives near the same spot with a business-like regularity, but if disturbed dives, and often disappears in a most marvellous manner. It was formerly much commoner on the Avon than it has been of late years, and was often caught in the fisherman's nets; on one occasion, when dragging the net for Roach, no fewer than three of the birds were taken in one day by this means. I knew an old birdcatcher who used always to eat the Little Grebe when he could get it, and he once told me it was very good either stewed or roast; tastes differ, but the natural smell of the species, together with the flabby and oily condition of the flesh, never seemed to recommend it as a very toothsome morsel. G. B. COREIN (Ringwood, Hants).

Nesting Notes.—On March 12th a Wild Duck was sitting on eleven eggs in a gorse-field near Stanmore, Middlesex. On April 20th a pair of Buzzards had three eggs, and a pair of Ravens five young in the nest, nearly ready to fly (Devon).—BERNARD B. RIVIERE (Flaxley, 82, Finchley Road, N.W.).

NOTICES OF NEW BOOKS.

The Natural History of Sokotra and Abd-el-Kuri, being the Report upon the Results of the Conjoint Expedition to these Islands in 1898-9. By Mr. W. R. OGILVIE-GRANT, of the British Museum, and Dr. H. O. FORBES, of the Liverpool Museums, &c. Liverpool: The Free Public Museums.

THERE is always an importance and charm in the delineation of insular faunas, and there is no lack of interest to the naturalist in this large volume. The Sokotran Archipelago, as described by the Editor, Dr. Forbes, or the summits of the larger islands, at all events, "are now known to be among the land surfaces of the globe that have longest, if not always, held their heads above the sea, their sculptured peaks and pinnacles attesting to the waste and wear they have so long endured. They have been mute witnesses probably since earliest Palæozoic times to the drowning of many lands around them, and to the uplifting from the ocean of mighty ranges on the two continents towards which they now look, and of which at one time or another in their wonderful vicissitudes they have formed a part." This expedition was distinctly a success, large collections were made, and the fauna and flora is monographed by a number of naturalists who are mostly all acknowledged authorities upon their subjects.

The mammals of Sokotra, so far as known, comprise eleven species; the African Ass (*Equus asinus*) is found in a wild condition, and has probably thus lived for "some thousands of years." Fifty species of birds were collected, ten from Abd-el-Kuri, and forty from Sokotra; these comprised eight new species, though some recorded by previous investigators were not found by this expedition. The avian enumeration contains many bionomical observations, and a musical representation of call-notes. Of the Reptiles, beyond the results of former expeditions, six new species were discovered, one referable to a new genus. The apparent complete absence of Batrachians from Sokotra is

one of the remarkable features to which Mr. Boulenger has drawn attention. The invertebrates, as might be expected, are very largely represented, but our space forbids an adequate reference; while botanists will find an authoritative enumeration of the flora.

This volume should find a place on all biological shelves; to the zoo-geographer its importance requires no insistence, and the many specialists who have contributed to the compilation compel its consultation by most zoologists. It is well illustrated by a number of coloured plates, and constitutes one of those books much endeared to naturalists—a work of reference to a small but very complex fauna, which, particularly as regards the invertebrates, is the better worked as the knowledge of the specialist is familiar with the fauna of a far wider area.

Controverses Transformistes. Par ALFRED GIARD. Paris: C. Naud.

UNDER the above title, Prof. Giard has republished some communications he has contributed on evolutionary subjects, which have appeared in different scientific publications. The first, and one which is of the most general interest, is entitled "Histoire du Transformisme—Buffon, Lamarck, Darwin," and is not only of historical importance, but reaffirms, what is so often forgotten, that the doctrine of evolution is not modern in conception, but only in application; that not only has the teachings of evolutionary biology permeated and profoundly affected all other realms of human thought, but that the suggestions of past thinkers have largely assisted the formation of modern evolutionary conceptions. The knowledge of evolution is, and always will be, the gradual unfolding of the cosmic process; the problem crops up in the weird questions and theories of ancient primitive races; its solution depends more upon scientific method than chance discovery, and will be synchronous with the mental evolution of man. When the process of evolution is thoroughly understood, the search for truth will be ended, and the obstinate questionings of man for ever disposed of.

Prof. Giard has well traced indications of the conception in the minds of many great French thinkers. Both Bossuet and Montesquieu affirmed that the mental condition of man and the

essence of his jurisprudence were largely affected by climatic conditions. Rousseau recognized the factor of heredity in man. Diderot advised the physician to abandon the *pourquoi*, and to occupy himself with the *comment*, thus in agreement with Goethe, who stated: "La question n'est plus, dit-il, de savoir pourquoi le Bœuf a des cornes, mais comment les cornes sont venues au Bœuf." Buffon, as is well known, advanced views which brought him under the censure of the Sorbonne, but, as Prof. Giard pertinently remarks, Buffon had not the temperament of a martyr. Of course, Geoffroy Saint-Hilaire and Lamarck have all consideration, and the author concludes his subject by reference "à l'édifice construit par trois grands génies, l'honneur de trois grands peuples, Goethe, Darwin et Lamarck!"

We have not space to refer to the other subjects dealt with in this book. The chapter devoted to "Convergence des Types par la vie Pélagique" is most invigorating to one who fails to see in every instance of concurrent evolution another capture for the net of "mimicry."

EDITORIAL GLEANINGS.

We are indebted to the Editor and Proprietors of the 'African World' for the following particulars relating to the killing of Elephants in the Congo Free State, and for the use of the block illustrating same. These appeared in their special "Congo" issue of April 16th.

CONGO IVORY. — The ivory market showed in 1903 an era of prosperity without precedent in the annals of this article. Not only is the figure of transactions of 356,350 kilos. greater than the quantities sold in 1902 by 34,000 kilos., and surpasses the average of the ten former years by 86,000 kilos., but the constant rise by which the article has benefited during the past year has continued with the same regularity, and reached about 10 per cent. at the end of 1903.

Elephant tusks of ordinary quality yield from 24 to 25 francs the kilo.; the *dents à bangle* (tusks for bracelets, *i. e.* tusks used for the rings worn by the Indians and by the natives of the East Coast of Africa), from 23 to 25½ francs; light tusks, 19½ francs; small tusks, 16 francs; *dents à billes* tusks for billiard-balls, *i. e.* tusks very round and full, of 6 to 8 centimetres diameter), 30 francs; solid (*scrivailles*), 18½ to 15 francs; unsubstantial, about 13 francs. Soft ivory has been less abundant—18,600 kilos., against 22,700 kilos. sold last year—and generally of a more imperfect quality. The average realized is hereby affected, as will be seen from the following list.

The ordinary qualities yield 29 to 32 francs; *dents à billes*, 35 francs. The importation has, according to the annual list of MM. H. and G. Willaert, brokers, Antwerp, risen to about:—

354,500 kilos. and the total of the sales to 356,350 kilos.					
Against	70,000	"	"	322,300	" in 1902
	27,000	"	"	312,000	" " 1901
	333,000	"	"	336,000	" " 1900
	328,000	"	"	292,500	" " 1899
	231,900	"	"	205,300	" " 1898
	265,000	"	"	281,000	" " 1897
	200,000	"	"	265,700	" " 1896
	362,000	"	"	274,500	" " 1895
	264,000	"	"	186,000	" " 1894
	224,000	"	"	224,000	" " 1893
	118,000	"	"	118,000	" " 1892
	59,500	"	"	59,500	" " 1891
	77,500	"	"	77,500	" " 1890
	46,600	"	"	46,600	" " 1889
	6,400	"	"	6,400	" " 1888

The stock amounts to 188,000 kilos.



CONGO IVORY AT ANTWERP.

Against 205,400 kilos. in 1902, 157,000 kilos. in 1901, 141,000 kilos. in 1900, 144,500 kilos. in 1899, 110,000 kilos. in 1898, 84,000 kilos. in 1897, 100,300 kilos. in 1896, 166,000 kilos. in 1895, 98,500 kilos. in 1894, 41,000 kilos. in 1893, 84,500 kilos. in 1892, 21,000 kilos. in 1891, 18,000 kilos. in 1890, 20,000 kilos. in 1889.

The 856,850½ kilos. sold last year were composed of :—

	K.	In 1902.	In 1901.	In 1900.	In 1899.	In 1898.
Congo, hard.....	240,448	against 215,819	222,745	237,607	207,355	131,500
Congo, soft	18,668½	„ 22,731	15,895	12,427	12,571	8,000
Angola	68,082½	„ 50,925½	20,385	46,004	53,240	58,000
Benguela, soft.....	—	„ 192½	598	—	235	1,100
Senegal.....	5,331	„ 5,802½	4,107	1,269	1,736	670
Gabon	9,400½	„ 9,215½	18,721½	11,982	12,322	1,000
Abyssinie	42	„ 185½	2,244	9,727	886	500
Mozambique	158	„ 728	8,040	1,046	—	—
Ambrize	4,289	„ 8,995½	6,850½	8,703	—	4,500
Cameroon	9,512½	„ 13,088½	16,459	10,681	2,968	—
Zanzibar	—	„ —	75	852	964	—
Siam	20	„ —	82	149	—	30
Egypte	180	„ —	1,158	—	—	—
Hippopotamus' teeth	204½	„ 151	107½	840	223	—
Rhinoceros' horns	—	„ —	—	22	—	—
Curiosities	124	„ —	92½	200	—	—
Kilos.	856,850½	322,284½	312,000	336,000	292,500	205,300

CONSUMPTION OF IVORY IN THE WORLD.

For.	England. Kilos.	America. Kilos.	Germany. Kilos.	France. Kilos.	Other Countries. Kilos.	Total Kilos.
Knife-handles	143,000	11,000	13,000	9,000	1,000	177,000
Piano-keys	14,000	62,000	57,000	29,000	—	162,000
Combs	16,000	21,000	23,000	31,000	—	91,000
Billiard-balls	9,000	13,000	12,000	14,000	1,000	49,000
Various	6,000	9,000	8,000	7,000	4,000	34,000
Total	188,000	116,000	113,000	90,000	6,000	573,000
Consumption in India						121,000
Consumption in China						13,000
General annual total						647,000

The legislation of the Congo Free State with respect to ivory aims principally at three points; the regulation applied to Elephant hunting, with a view to preventing the extinction of these animals; the recognition of the principle in virtue of which the carcasses of savage animals are considered as belonging to the proprietor of the grounds, and become part of his capital; and the free rights granted by the State to individuals for collecting ivory in the lands belonging to the State in different regions.



Fig. 1.—SPOONBILLS IN CONFINEMENT IN NORFOLK.

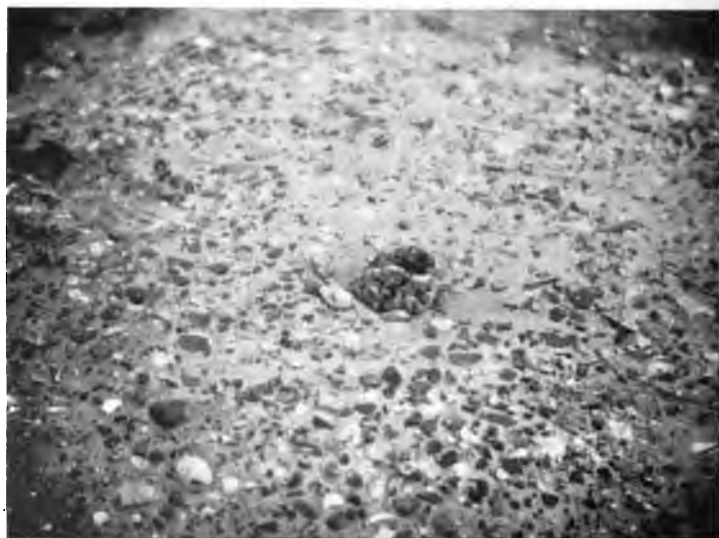


Fig. 2.—NESTLINGS OF *Sterna fluviatilis*, Google

THE ZOOLOGIST

No. 756.—June, 1904.

ORNITHOLOGICAL NOTES FROM NORFOLK AND THE EAST COAST OF ENGLAND FOR 1903.

By J. H. GURNEY, F.Z.S.

(PLATE II.)

As usual, "Norfolk Notes" refer largely to migration. This is the chief subject which impresses itself on the mind of any naturalist living on the east coast, and it is a strange sight in autumn to watch for the birds which have come in during the night, and, if there be a west wind, for those which will arrive in the morning. In this connection Mr. W. Eagle Clarke, during 1903, has made an experiment on a "floating light," which, although not on our coast, is well worth calling attention to.

Mr. Eagle Clarke remained on the Kentish Knock lightship, off the Essex coast, from Sept. 17th until Oct. 18th, and it is instructive to compare his observations ('Ibis,' 1904, p. 112) with those made during the same period by observers on the coasts of Norfolk and Suffolk. Mr. Clarke considered that the day migrations equalled those observed during night, but in Norfolk they are probably far inferior, except in the case of the *Corvidæ*, which are day migrants; but Mr. Clarke's statement shows how much there is still to be learnt. He is of opinion that immense numbers of birds are killed by contact with light-vessels which show a white light, and that many of the migrants avoid the force of the wind by flying close to the surface of the sea, which, in the case of the Sky-Lark, agrees with what I have observed off

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Cromer. Ninety per cent. of the birds he saw were going from east to west, which again corresponds with observations made at Cromer, with which, of course, Essex must have much in common.

It does seem that the direction of the wind is one important key to the right understanding of migration on the east coast of England. An east wind blows birds here, but if too long delayed in Europe with a west wind, they will cross the North Sea with that rather than not at all, but then they do not arrive until daylight, or perhaps continue arriving all the morning. Also, as pointed out by Mr. Clarke, birds may often leave Norway and Denmark with a favourable wind, and be overtaken while *en route* by changes which become more and more unfavourable as they approach the English coast. To understand their movements one wants to know the wind on both sides of the North Sea, and this the Daily Weather Report issued by the Meteorological Office enables us to do.

Norfolk received two memorable importations during the autumn of 1903—that on Sept. 19th and 20th composed of an almost unprecedented number of small land-birds (Redstarts, Pied Flycatchers, Robins, &c.), and that of the *Corvidæ* on Oct. 19th and 20th, just one month later. The former movement was with a N.E. wind amounting to a gale, and the congested hord of birds was at its maximum at the usual points on the coast, *viz.* Blakeney and Wells in Norfolk, Humber-mouth in Yorkshire, Flamborough Head, and the mouth of the Tees (T. H. Nelson). Yet it must not be supposed that the rest of the coast with less suitable halting-places did not receive some of the band. The second migration was less remarkable, *viz.* the Rooks and Crows, which made land in October, with a moderate S.W. wind following on a high wind the day before from N.W.; just the same wind they came with last year. Our shore-gunners are so accustomed to look out for the approach of Rooks in October, and for their departure in March, that the annually recurring phenomenon has ceased to excite any remark. It is very probable that among these bands were some of the Grey Crows ringed at Rossiten, in East Prussia, by Herr J. Thienemann. From Rossiten to Norfolk is six hundred miles by the map. Thienemann says one hundred and forty-eight were released between

Oct. 9th and 14th, 1903; there would therefore just have been the right time for them to get to England. As the object is to trace their migrations, anyone obtaining a Crow with a ring on its leg is requested to communicate with Herr Thienemann.

The number of birds of prey was above the average during the autumn, including some Buzzards. Mr. Nelson has tabulated the great migration of Rough-legged Buzzards into Yorkshire in October, only the fringe of which reached Norfolk, preceding by a few days the arrival of the Rooks, and the returns will no doubt be published; also particulars of the flight of Sabine's Gulls in September.

Besides the above there was a notable incursion of Waxwings into Norfolk (already alluded to by Mr. Tuck), commencing about Oct. 21st, but evidently reinforced by later comers until Christmas or later. This has been a larger migration of Waxwings than that in January, 1898. It is now certain that severe weather in this country has nothing to do with the advent of the Waxwing, whatever may be the case when they appear in flocks abroad. The Waxwing is simply a late winter visitant, but nearly every year there are migrations of Woodcock, Snipe, Blackbirds, Bramblings, Hawfinches, &c., quite as late, arriving up to Christmas and beyond it, and we merely do not think them remarkable because they are common species, and generally with us.

The rarities for 1903 were:—January, Sea-Eagle; April, twenty Nyroca Ducks; May, Roseate Tern, six Spoonbills; June, Avocet; July, Porphyrio; August, Glossy Ibis; September, Aquatic Warbler, two Icterine Warblers, several Bluethroats, ? Sabine's Gull; October, Waxwings, Roller.

In these Notes the direction and force of the wind is taken, unless otherwise stated, from the Daily Weather Reports issued by the Meteorological Office for Yarmouth (as marked by the recorder at 8 a.m.). It must be borne in mind that the direction of the wind at Yarmouth is not always quite the same as on the north coast of Norfolk—as at Wells, for instance. Even between Keswick (Norwich) and Yarmouth the difference is more than would be expected, and these differences may often account for a good deal.

The rainfall for 1903 (as kept at Keswick by Mr. Edward

Knight) was 31·18 in.—a decidedly wet year—the wettest month being July, and the driest February ; but rain does not seem to have very much bearing on migration. The fall during the four migratory months was :—August, 3·23 in. ; September, 2·96 in. ; October, 4·86 in. ; November, 1·83 in.

The following is the year's diary for 1903 :—

JANUARY.

1st.—Frost. Hen-Harrier at Hickling (M. C. Bird).

5th.—A Shag caught at Yarmouth (A. Patterson) ; certainly a commoner species with us than it used to be. Bean-Goose shot near Aylsham.

8th.—Nine White-fronted Geese identified on Breydon Broad, and about this time, or later, Mr. Southwell was informed that there were a good many at Holkham and Wells.

9th.—A Pink-footed Goose shot at Siderstrand (Hoare).

13th.—Mr. Pashley reports a fine Iceland Gull at Cley, and several Merlins.

30th.—A Sea-Eagle seen on the Broads (M. Bird), and afterwards at Melton (Dack), and a Buzzard about this time at Rollesby.

FEBRUARY.

9th.—The Sea-Eagle, shot at Ipswich (H. Hudson in the 'Field'), a young bird, as usual.

10th.—Redshanks returned to the Broads (M. Bird). This pretty wader, though not so abundant as formerly, still holds its own.

13th.—Two Lesser Spotted Woodpeckers at Twyford (C. Hamond).

18th.—Frost, but no wind. A flock of several hundred Linnets (*Linota cannabina*), as well as other smaller flocks, going S.W. at Neatishead, which is eight miles from the coast (M. Bird). See last year's note on the movement of this species in April, which is perhaps annual.

27th.—A "Coot-shoot" at Hickling Broad, but only lasting half a day, as the wind did not admit of shooting in the morning. Several Goosanders met with (G. Davies), probably the same seen by Mr. Bird on Jan. 31st on this fine sheet of water.

MARCH.

7th.—Mr. Bird reports early nests of the Thrush, Blackbird, and Wren, but I heard of two Thrushes' nests with eggs in them six weeks ago.

10th.—Mr. Robert Gurney repeatedly heard a Bittern on Sutton Broad, and again at intervals uttering its double groan until the 20th, when it left off "booming." The same, or another, let itself be heard at Hickling (Bird), and one was killed by a warrener's dog at Shadwell (W. G. Clarke), but of this I did not receive the date. They are rare birds now.

12th.—Greater Spotted Woodpecker "jarring."

17th.—Ringed Plovers beginning to nest (Bird).

18th.—Snipe gyrating in pairs; Bearded Tit singing.

20th.—W.S.W., 5, at Yarmouth; W., 2, at Keswick. Rooks and Grey Crows going south all day along the line of sandhills (Bird).

21st.—S.W., 5. Chiffchaff at Mulbarton (Dobbie). Cuckoo at Horsey on the coast (Bird). Great number of Knot at Hunstanton (Southgate).

22nd.—S.W., 5. Black Redstart at Lynn, and some days afterwards another at Yarmouth (W. Lowne).

24th.—Five Kestrels at Keswick circling very high in the air.

26th.—Swallow at Hickling.

27th.—House-Martin at Mundesley (Riviere).

28th.—Ray's Wagtail at Fritton (Upher).

29th.—Eight Great Crested Grebes† in pairs on Fritton Lake. Cuckoo seen at Yarmouth by Mr. Patterson, its second appearance in March. [It was also heard in Dorsetshire on the 24th, and in Hampshire on the 30th.]

30th.—Three Redshanks' nests† at St. Olave's ready for eggs.

31st.—N.W., 6. A Ruff and two Reeves (Bird). First arrivals in the Broad district of this species, which still clings to its old haunts in spite of all opposition.

APRIL.

3rd.—A Bearded Tit's nest with three eggs (Bird).

4th.—W., 5. The keeper on our principal Broad reported to Mr. Bird the following arrivals: Eight Tufted Ducks, fourteen Ruffs and Reeves, some Golden-eyes, and a Bar-tailed Godwit;

and, a few days afterwards, more Ruffs, a pair of Garganey Teal, and three Gadwall; also two Pintail, and a Shoveler's nest of eleven eggs, which hatched out on the 30th. There were said to be one hundred and fifty Gadwall at Euston near Thetford (W. G. Clarke) this spring.

10th.—A pair of Scoters at Hickling (Bird).

11th.—W., 1, on Breydon Broad; W.S.W., 4, off Yarmouth. A Spoonbill on Breydon Broad—an old bird with a long crest—which remained on the mud-flats until the 30th (Jary). Subsequent data of the Breydon Spoonbills, as kept by Mr. Patterson and Mr. Jary, may as well be given now:—May 6th, S.W., on Breydon: one (which remained to 12th). May 14th, W.S.W., on Breydon: two (which remained to 17th). May 20th, W., on Breydon: six (seen at intervals until 29th, during which time they probably visited Blakeney). July 21st, N., 4, off Yarmouth: one. July 24th, E.S.E., 2, off Yarmouth: one. S.W., on Breydon: one. Twelve altogether; not such a large number as have sometimes visited us, but there is a bridge over the lower end of Breydon now, which has been recently finished, and probably disturbs the birds. The regularity with which this species has appeared during the past seven years is shown by the following dates:—

1897.	First Spoonbill appeared on April 20th.
1898.	" " " 8th.
1899.	" " " 16th.
1900.	" " " 28th.
1901.	" " " 12th.
1902.	" " " 20th.
1903.	" " " 11th.
[1904.	" " " 19th, Patterson.]

In time it may be hoped that it will not only be a regular spring migrant, but a breeder again. In Sir Thomas Browne's day (1636–1668) their annual arrival is noted as taking place in March, but even then they had forsaken Reedham Wood.

15th.—It was during April that Mr. Patterson announced in the 'Field' that there had been a notable visitation of the Nyroca, or White-eyed Duck. They either came in or divided themselves into two flocks, which together amounted to twenty, one flock going to Rollesby Broad, and the other settling, on the 15th, on Hickling Broad, where these strangers only too quickly

attracted attention. The presence of such a large number of this rare Duck at one time in England is curious, and it is to be regretted that they were not fully protected, and that some persons who ought to have known better molested them. Those at Hickling were all males showing the black collar, as I learn from Mr. Bird, who had a good view of two of them as late as the 29th. No such appearance of *Nyroca* Ducks has been put on record in East Anglia before, and it is to be feared there is little inducement for any to come again. Four were seen at the same time in the West Riding of Yorkshire, as mentioned by Major Arundel (*ante*, p. 93), and it seems possible that all had crossed the sea in one band.

16th.—Mr. Bird reports some Ruffs watched by the Broad keeper fighting, but according to my experience it is only play, which never results in injury.

24th.—A Garganey Teal's nest with ten eggs in it, accidentally spoilt by marshmen (Bird), perhaps the produce of the same pair mentioned on April 4th. The Garganey is a rare bird now, and the Spotted Crake is much rarer than formerly in Norfolk; so is the Teal, but the Water-Rail holds its own, and the Bearded Tit, now almost safe from the rapacity of dealers, is even increasing.

28th.—S.W., 1. Two Spoonbills seen at Hickling Broad by the keeper (Bird), but they do not appear to have visited tidal Breydon, a far more favourite resort.

29th.—Two *Nyrocas*, as already mentioned, seen by Mr. Bird.

30th.—Some time this month Yarmouth birdcatchers took a male Grey-headed Wagtail,† which, with a diet of mealworms and a warm room, was successfully kept by Mr. Lowne through the winter. A male Grey Wagtail with a black throat was also seen on the Denes by Mr. Lowne, not at all a common bird with us in that plumage.

MAY.

4th.—E.N.E., 1. Scoter (a female) on Whitesley Broad (R. Gurney).

5th.—S.S.E., 2. Three Black Terns on Breydon (B. Dye); others at Hickling. Scaup-Duck at Fritton (Buxton). Tufted Duck at Sutton (R. Gurney).

6th.—Tufted Duck at Hickling.

20th.—S.W., 3. About this date, I am informed by Mr. Pinchin, five Spoonbills appeared on Blakeney muds, and were seen at intervals in the channel and harbour for more than a week. The first time Pinchin saw them they were half-way up the Cley channel, which is not far from the nearest houses in the village. It is likely they were the same birds which about this time frequented Breydon Broad.

21st.—Mr. Bird saw a pair of Common Sandpipers on the Broads, and a Marsh-Harrier, and found two clutches of Grasshopper-Warbler's eggs, and the keeper found another Redshank's nest with five eggs. The following day a Green Sandpiper and two Black Terns were seen.

29th.—A Roseate Tern seen by Mr. Pinchin, the only one on our coast this year, but he was confident of its identity.

31st.—Seventy Terns' nests counted by our watcher.

JUNE.

6th.—E., fine and warm on Breydon; wind much stronger (force 4) off Yarmouth. "An Avocet came, but did not stop long; after having a rest for about a couple of hours he flew away again to the N.E." (George Jary). The wind the evening before was N.N.E.

12th.—First Lesser Tern's eggs hatched (Pinchin).

13th.—Seven or eight Black Terns seen at the mouth of the King's Lynn Cut by Mr. C. Cresswell.

14th.—First Common Tern's eggs hatched on the beach.

18th.—Visited a large settlement of Common Terns, some account of whose nesting operations is given farther on (cf. p. 216).

20th.—A Marsh-Harrier seen at Hickling by Mr. Kearton.

JULY.

1st.—A Porphyrio, presumably one of the green-backed kind, seen, but fortunately not shot, on Stalham Broad (Bird).

23rd.—S.W., 2. Mr. Jary, the Breydon watcher, counted eighty-two Curlew and Whimbrel in one flock on the muds, indicating a very large number of non-breeders. This was the wettest July there has been for a great many years; my rain-gauge registered 5.33 in., and another in the same parish 5.79 in.

AUGUST.

19th.—S., 2.

20th.—W.S.W., 1. A Glossy Ibis seen at Acle (B. Dye).

21st.—The Ibis† shot at Halvergate, near Acle, proved to be an immature male, exhibiting the usual white spots on the fore part of the neck.

25th.—A Solitary Snipe killed at Horning by Mr. Barclay; another shot later near Scole (Southwell), and a Reeve at Rollesby (Burnand).

SEPTEMBER.

1st.—S.S.E., 5. Hoopoe at Mautby.

2nd.—E., 4. Shag at Yarmouth (Patterson).

3rd.—W.S.W., 4. Sabine's Gull seen at Cley (R. Arnold). The same day one was shot in Yorkshire, where others also occurred.

7th.—Some Little Stints reported, and a Dotterel.

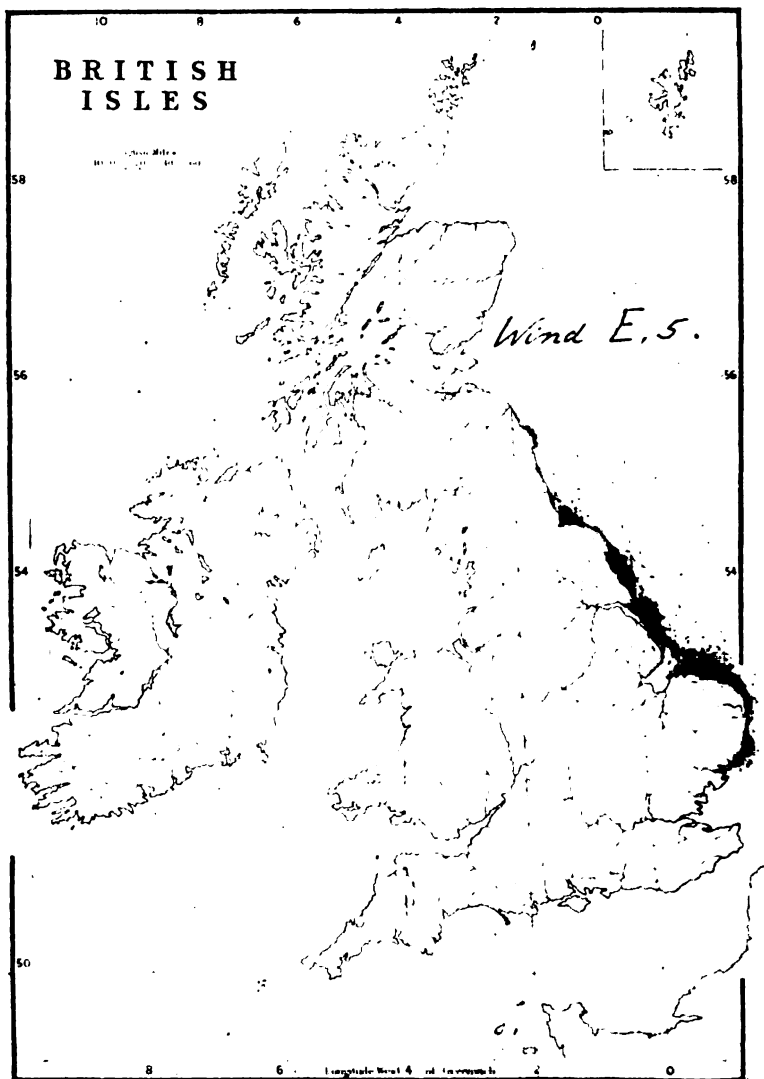
9th.—After a gale from N.W., Mr. R. B. Arnold noticed a large Gull hovering over something on the sand at Blakeney "bar," and, on going up, found a Manx Shearwater,† apparently unable to fly. Another was seen by Mr. Gunn, who also saw an Osprey.

14th.—N., 5. A Fork-tailed Petrel on Breydon Broad (Lowne).

18th.—E., 3, in the morning; N.N.E., 4, in the evening. A few migrants appeared in North Lincolnshire (Caton Haigh), but I saw nothing on the shore at Sheringham to prepare me for what was coming. An Icterine Warbler,† however, was shot at Blakeney, some seven miles further west, and some Redstarts seen. The wind at Yarmouth was as entered above, and it was practically similar at the same hours at the Skaw in North Denmark, at Cuxhaven in North Germany, and at Helder in Holland.

19th.—E., 5, at Yarmouth (N.N.E. the evening preceding). From the reports sent by Mr. Alexander Napier, of Holkham, Mr. Kay Robinson, and Mr. Pashley, it appears that from early morning a most unusual movement was in progress. From Brancaster to Salthouse, and especially among the herbage and bushes of Wells and Holkham sandhills, small migrants of the order Passeres were simply swarming. "More Pied Flycatchers and Redstarts," says Mr. Robinson, "arrived on the North

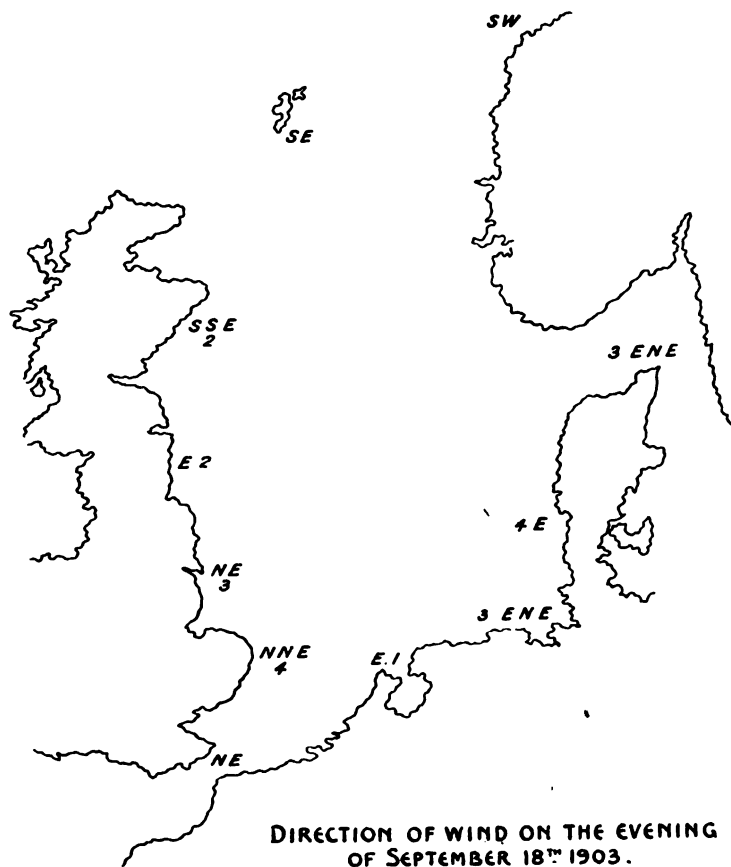
Norfolk coast in a day than I have seen in that neighbourhood during four years." Among the host were an Aquatic Warbler,



THE MIGRATION OF BIRDS ON SEPT. 19TH.

and four or five Bluethroats; but the bulk of the travellers consisted of Redstarts, Pied Flycatchers, Robins, Goldcrests,

Warblers, Whitethroats, &c., and in less quantity there were also Hedge-Sparrows, Spotted Flycatchers, Blackcaps, Wheat-ears, and Pipits, while overhead Mr. Robinson could see a few Rooks and Jackdaws and flocks of Gulls drifting inland. Such an extensive movement has not been witnessed for some time on our coast, and it is fortunate there were observers to watch it.



20th.—E., 5, at Yarmouth; E.S.E., 3, warm, at Keswick. Small migrants still on the coast in undiminished numbers, but not observed very much inland. Mr. A. J. Napier writes:—"I went down to the [Wells and Holkham] sandhills here, and the trees were simply alive with birds of every description—Red-starts, Whinchats, Robins, Pied Flycatchers, and many Warblers

I was unable to identify. It is not easy to identify in the thick bushes, but I certainly saw an Icterine Warbler."

In Lincolnshire the rush of migrants was as great or greater south of the Humber mouth, where it blew hard from E. with fog (Caton Haigh); while northwards the wave extended as far as Scarborough ('Zoologist,' p. 394), reaching to Durham ('Naturalist,' 1903, p. 459), and even slightly to the Northumbrian coast (G. Bolam).

At Teesmouth, Mr. T. H. Nelson tells me, there was also an extraordinary migration, consisting of the same species as in Norfolk, with the addition of Rock Pipits and a sprinkling of Stonechats. The "slag" walls at the south breakwater, he says, were alive with birds, and two Bluethroats were shot. Mr. Nelson ascertained that they were in abundance at Flamborough Head, and at Spurn Point also, where the travellers were seen by Mr. Loten and the lighthouse-keeper.

Southwards the invasion reached in a less degree to Harwich and the mouth of the Stour (F. Kerry), and to Essex (Eagle Clarke), but here its strength had evidently spent itself. I have been at some pains to ascertain how far this great line really reached, and only wish there were any means of correctly conjecturing the number of the birds which passed in those forty-eight hours. As the wind was from the east, it is likely that many of them came from the southern shores of the Baltic, crossing from the neighbourhood of Lubeck Bay to the mouth of the Elbe. The maps show the English coast affected—in extent more than two hundred miles—and the direction of the wind on both sides of the North Sea.

Here I would say a word on the increase of the Redstart. Besides the hundreds of Redstarts which every September pass along the coast of Norfolk, we have a considerable influx in the spring, and undoubtedly many more breeders than was the case twenty years ago, so that this species must be regarded as having considerably increased. All our small birds benefit by the systematic destruction of Stoats, Hawks, and Owls, as well as by the enforced quiet of the game preserve, and to this circumstance the increase of the Redstart may be due.

21st.—E., 6. By to-day the bulk of the migrants had passed on, but Mr. Haigh notified another reinforcement in North Lincolnshire.

22nd.—[Icterine Warbler seen off the Essex coast by Mr. Clarke.]

24th.—A Honey Buzzard at Northrepps, which, being captured uninjured, was kept alive for a time. Gadwall at Hunstanton (R. Clarke).

25th.—S., 2. Honey Buzzard shot at Sandringham ('The Field'), probably the same reported as from Wolterton by Mr. Clarke, who adds that an Osprey perched the same day on the mast of a boat at Brancaster.

26th.—W.N.W., 8. Honey Buzzard near Yarmouth (Lowne). Three Merlins seen at Wells by Mr. Napier.

28th.—W.S.W., 8. A young female Honey Buzzard shot at Stalham contained a wasp, some grubs, and a feather (Bird).

29th.—[A considerable movement observed by Mr. Eagle Clarke on the Essex coast, but it was unnoticed in Norfolk.]

30th.—Peregrine Falcon at Ormesby Broad (Lowne).

OCTOBER.

1st.—October set in with heavy rain and bad weather generally; in fact it rained on twenty-seven days out of thirty-one, although the greatest fall in twenty-four hours was only '85 (Knight).

11th.—[A great rush of birds was registered by Mr. Eagle Clarke from the lightship off the coast of Essex, but it was unnoticed in Norfolk and Suffolk.]

12th.—Rough-legged (?) Buzzard seen at Overstrand, and another about this time at Yarmouth. Hobby at Lowestoft (H. Bunn).

16th.—Rough-legged (?) Buzzard at Catfield seen going west (R. Gurney). [Twelve seen the same day in Yorkshire, 'Field.']

17th.—Rough-legged (?) Buzzard seen at East Ruston (Bird).

19th.—S.S.W., 3. To-day there was another migration, after a rather strong wind last night from the north-west. Straggling flocks of Rooks were arriving all day long, from 7 a.m. to 5 p.m., if not later, at short intervals, striking the coast, for the most part flying low with a slow wavering flight as if tired. Every flock passed inland as far as the eye could follow them, coming from N.E., and heading straight against the wind, which blew from S.S.W. With them I could see Jackdaws and a few Grey Crows, and occasional flocks of Starlings, and there may

have been Carrion Crows, but eighty per cent. were Rooks; also one or two flocks of Skylarks. Mr. Robinson reported in addition large companies of Lapwings at Wells, and hedges crowded with Blackbirds. In Northamptonshire a Hawk-Owl was shot, and perhaps it was in the same company that a Grey Shrike came over which was disturbed on Caister Denes making a meal of a Greenfinch† (E. Saunders), which it had impaled for that purpose. Similar arrivals of Rooks were watched on the same day at Warham (Robinson), Cromer, Overstrand, Siderstrand, Sutton (R. Gurney), Hickling, Yarmouth (Patterson and Dye), and even passing over Norwich (W. G. Clarke), so the extent of the flight was not small.

21st.—A Waxwing shot at Yarmouth. This was the first one, but small flocks must have continued to arrive until the end of the year, and even afterwards. According to the returns from different quarters of birds clearly identified, or birds shot [up to February, 1904], their presence was distributed as follows:—Nine in the Lowestoft district (Lowne and Bunn); twenty-four in the Yarmouth district (Lowne); thirteen in the Norwich district (Roberts); six in the Holt district; six in the Cley district; twelve in the Hunstanton district (Clarke).

In 1902 only a single Waxwing was reported for the whole county. This year I am glad to say there was a laudable inclination to protect the handsome aliens, at any rate on the part of some. A pair remained and were protected for several days in a shrubbery at Hanworth. For a short time there were four in the garden of the Naval Hospital at Yarmouth (Lowne). At Riverside House, Thorpe, a large rose trained over an arch was visited, and the Waxwings allowed themselves to be watched masticating the scarlet hips, the seeds of which I found dropped on the ground.

22nd.—S.W., 8. A female Roller at Gayton, near Lynn, perching on oak-trees in a turnip field, I am informed by Mr. R. Clarke, proved too tempting an object to be let alone.

23rd.—My son saw nine Norfolk Plovers at Hockham.

NOVEMBER.

1st.—A Water-Rail killed by contact with the Hasborough Lighthouse (Bird). Two Lapland Buntings reported at Yarmouth (Dye).

6th.—[About the 6th a Pekin Nightingale (*Liothrix lutea*)† was shot at Holkham on the marsh by the sea, and identified by Mr. Southwell. It showed no signs of confinement, but this is not an uncommon cage-bird. L'Abbé David calls it a very common species throughout the whole chain of the Himalayas and throughout southern China. The beautiful green and yellow tints were rather faded in this example.]

14th ?.—Fork-tailed Petrel† shot on Breydon (E. Saunders).

16th.—About this date Mr. H. Bacon saw a flock of Norfolk Plovers at Kelling, and some at Hindringham. Not many stay with us as late as November.

18th.—Forty-three Wild Swans—presumably Whoopers—flew over Sutton Broad, going N.W., and making a great noise as they flew (R. Gurney).

DECEMBER.

2nd.—Seventy Wild Swans seen at Hickling Broad by the keeper (Bird).

23rd.—An arrival of Woodcocks in the Cromer district, and an accession to the number of Blackbirds, which so often happens in December.

28th.—E., 6. A Fork-tailed Petrel—the third this year—caught on board a smack at Lowestoft during a gale from the east, and brought alive to Mr. Bunn.

30th.—As many as seven Hawfinches on my neighbour's lawn, and about twice that number announced on a lawn at Catton. If all these had recently crossed the sea, as may have been the case, so late a passage was unusual. For the last two years they have been scarce.

31st.—An Avocet,† seen at Aldborough, in Suffolk, by Mr. E. A. Pownall was unfortunately shot on the following day. Its presence was no doubt due to a gale from the east of several days' continuance, which on the evening of the 30th reached to force 8 at Yarmouth. There appears to be no previous mention of one in the eastern counties in December, but it has sometimes occurred in Ireland at that season. This storm-driven waif was in good plumage, and excellent condition, and formed the subject of an illustrated article by Mr. Patterson in 'The Daily Graphic.'

VARIETIES OF PLUMAGE.

A Robin with a white neck (Davey), a white Hedge-Sparrow at Dersingham (R. Clarke), a cream-coloured Starling at Cringleford, and five or six pied Blackbirds are varieties of no great account; nor was the white Swallow seen at Bixley on Oct. 14th very rare. Mr. Southwell has recorded two albino Moorhens, entirely white with pink eyes and yellow legs (Zool. 1903, p. 351). I am told their want of colour was detected when they were mere nestlings, and they were frequently seen and watched as they grew larger (W. Lowne).

NIDIFICATION OF THE COMMON TERN (*Sterna fluviatilis*).

The Common and Lesser Terns again had a successful nesting season at our chief station, and the Ringed Plovers also, thanks to the watcher put on by the local protection society, of which Mr. Q. E. Gurney is secretary, but the Oystercatcher, I am told, no longer nests there. Mr. Pinchin, who is in charge of these Terns, is confident that there were more than two hundred nests of *S. fluviatilis* with eggs in at one time. As many of the Terns doubtless breed twice, the total number of young ones brought off ought to have been about 1100, nearly every nest containing its clutch of three eggs lying snug in a wisp of grass.

Mr. Pinchin commenced watching on May 25th, on which day he found several eggs of the Lesser Tern, which on our coast lays rather earlier than *S. fluviatilis*, and generally apart from them. He tells me he found no young *S. fluviatilis* until June 14th, but by the 18th some of the young were runners, and many eggs on the point of hatching. Just at this time a warm sun is very helpful to the Terns. Unfortunately, instead of warmth, we had heavy rains, there being .64 in. in my rain-gauge on two occasions; and on the 18th we found two Lesser Tern nestlings and a Ringed Plover drowned, or dead from being uncovered.

The following are a few memoranda from my notes:—In the first place, mysterious squeaking can be distinctly heard inside the egg before it hatches. Then follows the act of exclusion, and the tiny occupant is to be seen breaking out of its own shell, now grown more and more brittle as the inner linings are absorbed by the young bird itself. The exit of the nestling Tern

takes place neck foremost; first the beak perforates a small hole, and then the bird's head and neck as they unfold press out a larger piece. But long before the young one has emerged the looker-on is lost in wonder as to how the nestling was ever kept in such a compass! As soon as it is liberated, the old Tern must remove the egg-shells, or they would be there. The eyes of a Common Tern are open from the instant of hatching, and by next morning it may, according to my informant Pinchin, have very likely crawled a yard or more. Indeed, the celerity with which all these young shore-birds acquire the use of their legs is astonishing, and a very great provision for their safety—evinced especially in the Ringed Plover.

The following statement affords an instance of this precocity: At 6 a.m. Mr. Pinchin observed a nest on the beach containing three eggs of the Common Tern, which he thought were near hatching, one of which was nearly white, and therefore very recognisable. At 2.30 p.m. he examined again, and the two normal eggs were hatched, but not the light-coloured one. At 4 p.m., when he took my son and self with him, the light egg was still unhatched, but the chirping of a young one inside it was quite audible. Beside it lay young one No. 2, whilst the third youngster had actually already crawled away to a considerable distance. The egg-shells belonging to Nos. 2 and 3 had gone.

There are few prettier sights than the view over a protected Terns' settlement. In Norfolk they are not content with a mere depression, generally making quite a respectable nest of grass-bents (marram, crab-grass, &c.), but with little idea of protection by colour; indeed, in some cases, the nests on the sand are most conspicuous, and it is a marvel how the eggs escape the Grey Crows and larger Gulls. In the Wells district Col. Feilden has told our readers that they chiefly employ the stems and last year's blossoms of the sea lavender. In Suffolk I have seen the white sea campion used.

At the beginning of July, Norfolk experienced a gale which I learn wrought some destruction in this Tern settlement, chiefly by preventing the old Terns from bringing food to their young (Pinchin). They also had some of their eggs blown out of their nests on June 8th and 9th (Pinchin), about the same time that Mr. Hepburn says the settlement in Kent suffered (Zool., *ante*,

p. 174). Breeding Terns are very much at the mercy of the weather, and it is not often June and July pass without some havoc happening—high tides sometimes engulf their eggs.

The photograph (Plate II., fig. 2) was taken by Mr. Edward Corder, of Norwich, and represents two nestlings. They have black throats, and are altogether much darker than the nestling Lesser Tern, with which they cannot be confounded.

NIDIFICATION OF THE HERON AND STOCK-DOVE.

Mr. Astley informs me of two Herons' nests at Melton, near Holt, and at Earlham there were seven nests, as against eight in 1902. A few Herons have for the first time nested at Rollesby (Connop), but none at Horning (Bird) or Mautby (Southwell). At Reedham, Mr. Southwell was informed there were eighty-five nests, but I have not been near enough to see more than about thirty, which can be counted from the train.

The only other memoranda of any consequence are an early Long-tailed Tit's nest at Thorpe in March, and three clutches of Stock-Dove's eggs taken in the garden of Northrepps Hall, and hatched under tame Pigeons in an out-door aviary, but only two of the young ones† have grown up to maturity, and they are still alive.

It may be mentioned that Mr. Patterson believes a pair of Greenshanks remained on or near Breydon tidal broad most of the summer. On July 9th he saw five together, of which two were apparently adult, and three young; the notes uttered by the former being perceptibly different from those of the latter. There is no reason, however, to think that Greenshanks have ever bred in Norfolk, although eggs have from time to time been attributed to them. Barren birds of all the *Charadriidæ* occur sometimes in summer. On June 21st Mr. Patterson saw a belated Grey Plover, and shortly after that there were Common Sandpipers on the Little Ouse below Thetford (W. Clarke); but this does not prove nidification, though certainly the Common Sandpiper has once bred at Hickling.

WOOD-PIGEONS AND ROOKS.

July 11th.—Wood-Pigeons attacking the young Swede turnips, and eating the leaf when about three inches out of the

ground, which, combined with lack of rain, was quite sufficient to kill the plant and necessitate a fresh sowing of the field. Rooks are often guilty of the same habits, and between the two the farmer loses considerably. Rooks and Jackdaws have also been very busy making holes in what few wheat-stacks still remain unthreshed, doing a great deal of harm, as they pull out as much as they eat, and let in the rain.

However, I do not wish to take away their character, as Mr. H. B. Dobbie, of Thorpe, has identified in their crops the following larvæ: - Click-beetle, cockchafer, summer-chafer, crane-fly, pea-weevil, bean-weevil, and diamond moth; also slugs, snails, millipedes, woodlice, centipedes, and earwigs, most of which are destructive.

ALLEN'S GALLINULE.

In 'The Ibis' (1903, p. 431), Mr. Joseph Whitaker announces two occurrences of *Porphyriola alleni* in Sicily—one in December, 1902, the other in January, 1903—as well as the capture of a third in North Tunisia in December, 1902. I submit that this is corroboration of the genuineness as a wild migrant of the example taken on a boat at Yarmouth on January 1st, 1902, and already recorded (Zool. 1902, p. 98). It is certainly remarkable that this Gallinule should come at this time of the year to any part of Europe, for it would be more natural to expect its visits late in spring or in the early autumn.

In the 'Avifauna Italica' Prof. Giglioli dwells on the fact of this African Waterhen choosing the winter months in which to visit Europe; and in the 'Primo Resoconto Risultati Inchiesta Ornitolog. in Italia,' i. Avif. Italica, p. 550 (1889), he gives notes on other examples believed to have been obtained in Italy. See also 'Manuale di Orn. Ital.' del Arrigoni degli Oddi, p. 642. All the tribe of Gallinules seem to be wanderers; they are believed to fly high on migration, and thus are probably easily carried away by strong winds, which accounts for their being not infrequently caught at sea.

THE AMSTERDAM ZOOLOGICAL GARDENS.

BY GRAHAM RENSCHAW, M.B.

ALTHOUGH well known to continental naturalists, the extensive Gardens which the Society "Natura Artis Magistra" maintains at Amsterdam are not so familiar as they deserve to be to English visitors. Established in 1837, these Gardens are amongst the oldest of European "Zoos," and now extend over twenty-five acres of land, though they commenced modestly enough with a private museum and less than four acres for the menagerie. Repeatedly enlarged to meet its growing popularity, this fine institution was definitely completed in 1882 by the erection of an aquarium building, and will challenge comparison with any of its sister establishments for the richness and scientific value of its collections. The Gardens are pleasantly situated, with the entrance in the Kerk Laan, and are accessible by tramway from all parts of the city.

The visitor may conveniently begin his inspection by studying the Llamas, Alpacas, &c., in their pens near the entrance-gates, and can then pass on to the Deer and cattle-pens adjoining. At the time of my last visit there were four American Bison (*Bos americanus*) on exhibition; the much rarer European Bison (*B. bonasus*) had recently died. Amongst the Deer was a young Moose (*Alces machlis*), his antlers projecting as rounded buds from the side of his ugly shapeless head, and his enormous muzzle twitching with uncouth regularity as he alternately expanded and contracted his nostrils.

A deafening chorus of Parrot voices greeted one's entrance into the bird-gallery. Leadbeater's Cockatoo (*Cacatua leadbeateri*), Jardine's Amazon (*Pæcephalus gulielmi*), Golden Conures (*Conurus solstitialis*—four specimens), Lories and Parakeets of every description, were responsible for this unwelcome uproar; but the long rows of neat cages (their enamelled fronts maintained spotlessly clean by the Dutch keepers) contained

many other birds besides Parrots. The Laughing Jackass (*Dacelo gigas*), a Kingfisher which does not fish, uttered his cheery notes. The Crowned Pigeon (*Goura coronata*) of New Guinea squatted on its straw like a barnyard fowl, or rather like a Turkey, which it rivalled in size. The beautiful Nutmeg Pigeon (*Myristicivora bicolor*), the whiteness of its snowy plumage softened on the head by the faintest tinge of yellow, and replaced on wings and tail by a bold contrast of black, sat contentedly on its perch. The exquisite Cæreba (*Certhiola cyanea*), or Sugar Bird, recalled, in its tiny azure body and curved beak, its near relations, the Sun-birds of Africa. Glossy Starlings (*Lamprocornis* and *Lamprocolius*) figured in the series, their lovely plumage scintillating with varying *nuances* of purple and violet, well set off by their golden eyes; one of these birds was a partial albino, sporting several white feathers on its breast. In an adjoining room a young male Lesser Bird of Paradise (*Paradisea minor*) sat sunning itself, with head turned on one side and expanded drooping wings, as if to present as large a surface as possible to the solar rays. Being only about three years old, it lacked the gorgeous flank-plumes of the adult, though the wire-like shafts springing from the centre of the tail were just bursting their sheaths, and the characteristic straw-yellow feathers were recognizable on the head. This bad-tempered bird kept up a continual screaming if anyone approached its cage, thus displaying the cloven tongue and the bristly projections which studded the roof of its mouth. Mantell's Apteryx (*Apteryx mantelli*), the wingless bird of New Zealand, showed itself as apathetic as the *Paradisea* was vigorous; for, when turned out of bed, it stood stupidly still (pseudo-mammalian in its coat of hair-like feathers), and after a few seconds ran heavily forwards to plunge into its straw.

The Reptile collection included Alligators (*Alligator lucius*)—one very savage specimen—Monitor (*Varanus* sp.) and Heloderm Lizards (*Heloderma suspectum*), Pythons (*Python* sp.), and Boa-Constrictors (*Boa* sp.). One cage contained twenty-six baby snakes (Anacondas—*Eunectes murinus*), a bulge in the anatomy of one of these promising infants indicating the grave of an unfortunate Mouse. In the tank opposite the snakes was a Green Turtle (*Chelone viridis*)—so difficult to keep in captivity—and a

Hawk's-bill Turtle (*Chelone imbricata*). The graceful swimming movements of the latter, the oar-like paddles acting in a diagonal plane with a very free movement from the shoulder, gave a very different idea of the reptile to that usually conveyed by a dried specimen in a museum. Some very fine Grass-Snakes (*Tropidonotus natrix*) were exhibited in a large case provided with a fountain, which trickled over rockwork, green with moss, into a capacious basin—a remarkably pretty and interesting sight. A series of living insects—Swallow-tailed Butterflies of various species, Hawk Moths, Tiger Moths, Silk Moths, Stag Beetles (*Lucanus cervus*), and so on—was kept in this part of the Gardens.

Carnivorous animals are fully represented at Amsterdam, and the well-lighted Lion House, built in 1859, usually contains a good series of Lions and Tigers, Leopards and Pumas. The rare Maned Wolf (*Canis jubatus*) from Brazil was exhibited there during 1899–1902; in spite of its long legs it was a very interesting and beautiful animal, moving about its cage with an elegance that recalled the gait of a Giraffe. Another remarkable beast was a cream-coloured specimen of the Himalayan Bear (*Ursus tibetanus*), an animal which is normally jet-black, with a white mark on the chest. Two examples of the rare Ursine Dasyure (Tasmanian Devil), *Sarcophilus ursinus*—squat little beasts, whose blinking sun-blinded eyes belied their nocturnal ferocity—were in the Small Mammal House when I last visited it; also two splendid Ocelot Cats (*Felis pardalis*), as large as small Leopards, together with a couple of Geoffroy's Tiger-Cats, and a Fettered Cat (*F. maniculata*) from Africa. There was also a fuliginous variety of the Common Phalanger, *Trichosurus vulpecula* ("Opossum" of the Australians), in a beautiful coat of rich brown fur; an American Skunk (*Mephitis mephitis*); and a Paradoxure or Palm-Civet (*Paradoxurus* sp.). A Grison (*Galictis vittata*)—half-Badger, half-Weasel—rushed about its cage very much awake, and screeching excitedly, its voice, on the approach of the keeper, rising into an ear-piercing scream.

The collection of hoofed animals included a pair of the Short-horned Buffaloes (*Bos* sp. ?), which inhabit Southern Asia. These splendid beasts were covered with long shaggy black hair, with

the tail-tassels yellow. Their coat was quite wavy, curling upon the fore legs in little wisps and tags, while the hair situated between the horns of the bull was absurdly parted in the middle, as if it had been brushed by a hairdresser. The Antelope pens contained several Nilgai (*Boselaphus tragocamelus*), including a young bull whose coat was fast darkening to the blue-grey of maturity. There were also a pair of Singeing Waterbuck (*Cobus unctuosus*), a Reed-Buck (*Cervicapra arundinum*), an Indian Antelope (*Antilope cervicapra*), and a Leucoryx (*Oryx leucoryx*). A fine Eland (*Taurotragus oryx*) of the now rare unstriped race was specially interesting, by reason of its unequal horns, one of which was curiously curved at the tip; his consort was a young cow of the striped (Livingstone's) subspecies. Both Burchell's (*Equus burchellii*) and the Mountain Zebra (*E. zebra*) were represented in the equine portion of the collection, as was also the Shetland Pony! In the Hippopotamus House one of the inmates (*Hippopotamus amphibius*) was tame enough to come up to the railings for a piece of bread, rearing itself up with both fore feet planted on the parapet like an enormous Pig, and eating the bread with a remarkable sighing noise at each bite, as if its respiration was slightly impeded.

There were several Porcupines (*Hystrix cristata*) amongst the rodents in the Amsterdam Collection, and these, when gathered together round their food, produced a most curious effect on the eye by reason of their waving manes, and the long white quills, which swayed continually, recalling a clump of reeds agitated by the wind. Hard by a Prairie-Dog (*Cynomys ludovicianus*) was seen busily scratching out the earth with his fore paws, and throwing it backwards between the widely straddled hind feet. A white Hedgehog (*Erinaceus europæus* var.), some beautiful black and cinnamon Squirrels (*Sciurus prevosti*), and a couple of Spotted Pacas (*Coelogenys paca*) inhabited this part of the Garden. An Armadillo (*Dasypus villosus*) scuttled rapidly over the ground like a Woodlouse in its coat of mail, and not far away a red Kangaroo (*Macropus rufus*) dozed in the sunshine, its Deer-like head poised gracefully on the elongated neck.

The beautifully appointed aviaries are a pleasing feature at Amsterdam. One of them contained Toucans (*Rhamphastus* spp.), Jay-Thrushes (*Garrulax* spp.), Troupials (*Icterus*), and Glossy

Starlings, the metallic plumage of the latter making a charming feature against the tender green foliage amongst which they perched. Another aviary sheltered a collection of tinamous (*Crypturus*) Partridge-like birds from South America, and also an African Ground Hornbill (*Bucorvus abyssinicus*), which could whine like a spoilt child, and a Celebean Maleo (*Megacephalon maleo*). The Maleo is very rare in European "Zoos"; about the size of a small Turkey, it is remarkable for the knob-like excrescence on its head, for its breast delicately tinted with salmon-pink, and for its habit of burying its eggs in the hot sand to be hatched by the sun. The Golden Eagle (*Aquila chrysaëtus*), the Harpy Eagle (*Thrasaëtus harpyia*?), the Angola Vulture (*Gypohierax angolensis*), the Condor from the Andes (*Sarcorhamphus gryphus*), the Collared Owl (*Syrnium torquatum*) from Surinam, and the vulturine Guinea-Fowl (*Acryllium vulturinum*) from East Africa were but a few amongst many very interesting birds in this magnificent collection. Amsterdam is remarkable for the liberal amount of space which is allowed to the Water-Birds; the Waders have a special aviary of their own, where the scarlet coat of the American Ibis (*Eudocimus ruber*) glows like a live coal amid the greenery; and the beautiful Sacred Ibises (*Ibis æthiopica*), blue-black and snow-white, hatch their eggs and rear their young.

In concluding this account of the Amsterdam Zoological Gardens, it may be mentioned that only a few of the features of this flourishing establishment have been herein indicated. The excellent museum of stuffed animals, with its many rarities, such as the true Quagga (*Equus quagga*), which once lived in Lord Derby's famous menagerie at Knowsley Hall; the well-filled library; the aquarium; the museum of preserved reptiles; all merit special study. An Englishman visiting these Gardens will find much to instruct, amuse, and delight him for hours, days, or even weeks, according to his temperament and his love for natural science. *Crede experto!*

OBITUARY.

ROBERT McLACHLAN.

THIS well-known entomologist died at Lewisham on May 28rd, in his sixty-seventh year. He was born on Tower Hill, where his father for many years pursued the occupation of a marine optician, eventually retiring from business with a competency, which was inherited by his sons, and which enabled our deceased friend to escape the cares and responsibilities of earning an income.

If, however, he was not a self-made man in a financial sense, he had the honour of being largely so in an educational direction, for we have heard him remark that had he not studied entomology, he would have known no other language than his own. We first met him nearly fifty years ago, after his return from a voyage to Australia and China in a sailing-vessel belonging to the family interest. He had not then prominently attached himself to entomology, which he afterwards did while enjoying the friendships of J. W. Douglas and the late H. T. Stainton.

Robert McLachlan possessed an unique personality, and, being of a strenuous disposition, exercised no little influence on the course of British entomology. He joined the Entomological Society in 1858, and subsequently held the successive offices of Secretary, President, and Treasurer. In the last position his essential business capacities were of real value to the Society, and he proved a model Treasurer, who will be much missed. It is probable that no member of the Society held a more important view of its functions than did Mr. McLachlan; he was always assiduous in his attendance at its meetings, and what was remarkable, seemed to know more than a little about every one of its members. He was not only one of the founders of the 'Entomologist's Monthly Magazine,' which has now reached its fortieth annual volume, but he was the guiding and dominant

spirit of that excellent publication, which he directed with an intense sense of responsibility, as was observed in all his other undertakings. Although perhaps not a brilliant man, he was a learned entomologist, and without doubt was one of the most capable all-round entomologists since the death of Prof. Westwood. He possessed a retentive memory, and his knowledge of entomological writings was profound; in fact, one often thought that he must have read every entomological paper as it appeared, and thus have had little time for perusing other topics. As an author, he will be remembered by his 'Monographic Revision and Synopsis of the Trichoptera of the European Fauna,' and he recently contributed a few ornithological notes to 'The Zoologist.'

With Robert McLachlan a very distinct personality has passed away. If he did not always make friends, those who knew him intimately held him in high regard.

NOTES AND QUERIES.

MAMMALIA.

Varieties of Polecat and Badger.—When visiting Aberystwith a few weeks ago, I saw, at the shop of Mr. Hutchings, the taxidermist, a curious variety of the Polecat. It was entirely of a very light brown colour, and devoid of the usual facial markings. It was killed on the edge of Tregaron Bog in March, and about twelve months earlier another exactly similar specimen was obtained on the opposite side of the same bog. I may mention that Polecats are still numerous in the locality. Early in May I saw, at Mr. Coolse's, Shrewsbury, a half-grown Badger, just received for preservation from Worcester. It was a most peculiar colour; all those parts which are usually grey or black (including the eye-stripe) were of a fawn or light brown hue, and even the white parts were slightly suffused with the same tint. The Badger is so little subject to variation that this example is specially noteworthy.—H. E. FORREST (Hillside, Bayston Hill, Shrewsbury).

AVES.

Early Nesting of the Lesser Whitethroat in Surrey.—On May 8th, in a lane not far from Leatherhead, I found two nests of the Lesser Whitethroat (*Sylvia curruca*) with the full complement of eggs, viz. five each. I also found in the same lane three nests ready for eggs. My previous earliest note is May 16th, with five eggs. In each case incubation had not commenced. I am pleased to say that of late years this bird has increased considerably both in Kent and Surrey. I may mention that the hedges of a neighbouring lane, which these birds also frequented, have been cut down, consequently they have been driven to the lane mentioned. — P. F. BUNYARD (57, Kidderminster Road, Croydon).

White Wagtails on Bartragh.—It may interest some readers of 'The Zoologist' to learn that *Motacilla alba* has paid its usual spring visit to the island of Bartragh this season, my friend Capt. Kirkwood having observed a little flock of six birds on May 10th; but these remained to rest for only a few hours, and then resumed their northern flight. On the 13th he saw a solitary bird, which he kindly shot for me, as I required

it for the collection of the Belfast Museum. These birds were seen on their usual haunt—the damp sandy pasture outside the Bartragh garden—where they are always to be met with when visiting the island. They have now been known to visit Bartragh every spring for seven years in succession, regularly appearing in April or May, almost always after or during high northerly winds, which evidently delay their flight, causing them to drop down on Bartragh to rest for a few hours before continuing their northerly course. The numbers seen vary very much. Some seasons only one or two birds seen, occasionally five or six, but one season (that of 1898) a flock of fifteen birds was observed, and these only rested for three or four hours, and then resumed their northern flight.—ROBERT WARREN (Moyview, Ballina).

An unrecorded Occurrence of the Scarlet Grosbeak.—A specimen of the Scarlet Grosbeak (*Pyrrhula erythrina*) is preserved in the collection of stuffed birds at Maesllwch Castle, Glasbury-on-Wye, where I had the pleasure of inspecting it upon May 5th. It is a male in full plumage, and shows no indication of having been in confinement. I am informed that it was shot about thirty years since by a gamekeeper named Sharp, then living at a place called Higherland, upon the Grouse-moors near Painscastle, Radnorshire. Sharp, who is still living, states that he saw the bird on the hill about a mile beyond Glascombe, and that he believes it was in the spring.—J. H. SALTER (University College, Aberystwyth).

Moorhen's Egg in Nest of Magpie.—While out sacking Magpies' nests on April 30th with my brother, I came across a Magpie's nest up a thick thorn-hedge, about one hundred yards from a small stream, while on the other side of the hedge there was a small pool. After getting up to it, and putting my hand in, to my surprise I felt one egg much larger than the others, and this turned out to belong to a Moorhen. As there were also three ordinary Magpie's eggs in the nest, this must have been deposited by the Moorhen, as it was obvious no one had been up to the nest previously. I should be glad to know if this has ever been heard of before. We have never seen it, although we have taken some three hundred nests in similar country at the foot of the Clee Hills in Salop.—G. TOMKINSON (Franchise Hall, near Kidderminster).

Ornithological Notes made on a Trip to the West Indies.—

Lat. 28° 11' N., long. 80° 39' W., Jan. 28rd.—At 7 a.m. a bird much resembling a Little Egret (*Ardea garzetta*) was seen to fly over the bows of our ship, hovering round it for a few minutes, and then flew off due

west. At the time we must have been about nine hundred miles from the nearest land. This bird is stated by Cory to inhabit the Bahamas and Greater Antilles. It is also found in Africa, but I cannot find any satisfactory explanation for its being found so far from land. Unfortunately I cannot certify to its being *Ardea garzetta*, not being sufficiently conversant with the bird to enable me to identify it without doubt, but, so far as my knowledge goes from the many similar descriptions given me, I should put it down as a Little Egret.

Lat. 15° 54' N., long. 66° 28' W., Feb. 7th. — Between Martinique and Jamaica, in the Caribbean Sea, I noticed Greater Shearwaters (*Puffinus gravis*) in large numbers. They were flying in flocks, passing at intervals of about an hour, in an easterly direction. Most of the flocks were long and straggling, in one of which I counted one hundred and sixty birds, covering about a quarter of a mile of sea. Now and again they would mount and wheel round high overhead, then suddenly drop and resume their previous mode of progression. I never actually saw them plunge into the water, but at the time they created a great commotion among the Flying Fish, which were very numerous. Some of the flocks passed within several hundred yards of the boat, but seemed to take very little notice of it, none following in its wake, as do the Gulls, to feed upon the scraps thrown overboard. This fact is also mentioned by Mr. Bowdler Sharpe in his 'Handbook of British Birds,' vol. iv. It is, I believe, somewhat unusual to find this bird in large flocks. Mr. Bowdler Sharpe states that "sometimes half a dozen may be seen together, but more often they are in pairs." The identification of these birds is almost certain, their large size, together with white breast and short tail, making them easily recognizable with a good glass at so short a range.

GIBRALTAR, March 1st.—In the harbour here I noticed, amongst a large gathering of Gulls, one specimen of the Mediterranean Black-headed Gull (*Larus melanocephalus*), which was also recognized by an eminent ornithologist on board, but of course I could not obtain the bird. This Gull is not often seen in the harbour, and is seldom found to the west of Malaga, its place here being taken by *L. ridibundus*.

BAY OF BISCAY, March 4th.—While crossing the bay a flock of about twelve Meadow-Pipits (*Anthus pratensis*) followed our boat. As evening came on they settled on board, worn out with fatigue. They were quite tame, and allowed themselves to be caught by hand. They seemed badly in need of water. Several of these little birds remained with us until we reached Plymouth, resting on the boat by night, and by day flying on the lee-side of the ship. This is a somewhat early

date for Meadow-Pipits to be seen. I also thought I saw a Wagtail, but of this I am not sure.—D. A. BANNERMAN (Guildford).

Ornithological Notes from Shetland.—

SHORT-EARED OWL (*Asio accipitrinus*).—A good many seen during the winter.

SNOWY OWL (*Nyctea scandiaca*).—One, immature, Nov. 18th, 1908; one, quite white, reported to me from Haroldswick, Nov. 17th, 1908.

WHOOPEE SWAN (*Cygnus musicus*).—A few passed south, 11 a.m., Oct. 25th, and at 8 p.m., Nov. 28th, 1908. Five passed overhead in a northerly direction at 6 p.m. on March 24th, 1904. Heard overhead, flying north-west, 11.80 p.m., April 29th, 1904.

SMEW (*Mergus albellus*).—Two at Baltasound, Oct. 80th, 1908. These are the only ones I have ever seen in Shetland.

ROSE-COLOURED STARLING (*Pastor roseus*).—One—the only one I have ever seen alive—in the garden at Halligarth, on Nov. 6th, 1908; it was sitting on a branch of a mountain-ash, and I had a good look at it.

WAXWING (*Ampelis garrulus*).—My little girl found the remains of one hanging in the honeysuckle in front of my house, Nov. 12th, 1908. Judging by its appearance, it had hung for about a fortnight.

GLAUCOUS GULL (*Larus glaucus*).—A few seen during the winter.

WOODCOCK (*Scolopax rusticula*).—One at Burraforth, Feb. 12th, 1904. Many reported from near Lerwick about the same time.

JACKDAW (*Corvus monedula*).—One at Haroldswick along with some Rooks, Feb. 14th, 1904. One at same place, March 9th, 1904.

SONG-THRUSH (*Turdus musicus*).—One at Halligarth, March 5th and March 9th, 1904.

CHIFFCHAFF (*Phylloscopus rufus*).—A good number from April 15th to 26th, 1904.

BRAMBLING (*Fringilla montifringilla*).—A great many from April 16th to May 27th, 1904.

WILLOW-WREN (*Phylloscopus trochilus*).—Many, April 19th. A few still about Halligarth, May 27th, 1904.

SISKIN (*Carduelis spinus*).—At least two, April 19th, 1904.

WHITE WAGTAIL (*Motacilla alba*).—One shot at Haroldswick, April 25th, 1904.

HAWFINCH (*Coccothraustes vulgaris*).—One, a female, brought to me alive on May 8rd, 1904. So far as I am aware, this is the only record for Shetland.

LITTLE GULL (*Larus minutus*).—One at Nyrasound, May 8rd, 1904.

BLACKBIRD (*Turdus merula*).—Not so plentiful as usual; four birds hatched May 10th.

CUCKOO (*Cuculus canorus*).—Heard at Baltasound, May 20th, 1904. T. EDMONDSTON SAXBY (Halligarth, Unst, Shetland).

Aberdeen: Migration Notes for April. — Wheatears (*Saxicola ænanthe*) were seen on April 8th; numerous Ring-Ouzels (*Turdus torquatus*) on April 18th. The Dunlin (*Tringa alpina*) I heard on the evening of April 29th. A point worth noting is that one of these birds has appeared at my mill-dam, and very tame. Would this be the bird which took to the surroundings of the farm-steading last year before they departed? I fancy so, as it frequents the same places, but I had not marked it.—W. WILSON (Alford, Aberdeen, N.B.).

NOTICES OF NEW BOOKS.

Sir William Henry Flower, K.C.B., F.R.S., &c. A Personal Memoir. By C. J. CORNISH, M.A., F.Z.S. Macmillan & Co., Limited.

THIS volume is well described on the title-page as "A Personal Memoir," and in its plan and conception reminds us strongly of the life of Louis Agassiz, which was written by his widow. Mr. Cornish remarks in his preface that if "the personal element is accorded rather more space than might have been expected in a memoir of a distinguished man of science, and any critic cares to press this point, the writer is prepared to say *mea culpa*." There is some truth in this suggestion. After reading the book we only receive the impression of an appreciation (to use a word now much in use for biographical notice) of a most amiable gentleman, an accomplished director of a great museum, a mover in the very best society, and a good broad churchman. But Sir William was a greater man in biological science than Mr. Cornish seems to suspect; as a naturalist, and especially as an anthropologist, his great work is capable of analysis, and its importance not difficult to define. The "List of his Published Writings," without comment, might give simply an idea of industry, and affords little clue to his life-work, while he was more than the famous director of a great museum, and had made his mark outside.

In perusing these pages one is frequently forced to ask—does Society afford a help or hindrance to a man of science? The work of Sir Wm. Flower lay in one direction; he was entrusted with a talent of considerable value, his constitution was not robust, and he voluntarily took on much social fatigue. We like to remember him as a great zoologist, among his dead animals, rather than among the live lords, and though the index to the volume is an awe-inspiring list of eminent names, we wish it referred more to the subject-matter which really dominated an eminent scientific career.

Eleanor Ormerod, LL.D., Economic Entomologist. Autobiography and Correspondence. Edited by Prof. R. WALLACE. John Murray.

WE have already (Zool. 1901, p. 810), in paying our tribute to the memory of Miss Ormerod, dealt largely with many personal details, but the present volume adds considerably to our knowledge of a happy and useful life. Miss Ormerod had many advantages; she possessed a particularly attractive personality; was an enthusiast in her life-work; and was possessed of ample means to carry on an economic and entomological propaganda which could rely on no funds or pecuniary assistance of any kind. She represented personally and unaided in England what constitutes a government bureau in the United States.

The charm of this volume will be found in the few chapters of personal reminiscences contributed by the deceased lady herself. They constitute a sketch of life in provincial England which is now rapidly becoming a story of the past, and which has been immortalised by George Eliot. The larger part of the publication is occupied by her correspondence, which, like all similar material, is unequal in value, at least to those who are conversant with her entomological annual reports. We heartily welcome an important addition to the lives of British naturalists.

EDITORIAL GLEANINGS.

MR. WM. S. MARSHALL has sent us the following most interesting account of the processionary habits of the larvæ of a North American Moth (*Hemileuca maia*). His original communication appeared in the 'Biological Bulletin' of the Zoological Laboratory, University of Wisconsin, May, 1904.

"In the autumn of 1901, while collecting along the marshy shore of Lake Wingra, near Madison, I noticed many specimens of the Maia- or Buck-Moth (*Hemileuca maia*) flying low over the marsh. Both males and females were present, and many of the latter, having settled, were laying their eggs on the grass. These were placed in a somewhat irregular set of spirals closely packed together, so that when they hardened the grass could often be pulled away, leaving the eggs stuck together, and forming a short tube. The process of oviposition and the arrangement of the eggs has been described by Riley,* and copied by Packard.†

"Without having any definite plans in view, I collected a great many of the eggs, most of which I put in a cold place, but a few I left in an open bottle in my room. One morning I noticed on the neck of this bottle a black mass, which was found to be a group of young caterpillars; they had evidently hatched but a short time before. Later in the morning I again looked at the eggs, and found that more had hatched; all in the first bunch, having in the meantime left the bottle, were marching in a line on the table. Again, later in the day other groups were seen, and in nearly every instance each group had formed a line, marching in a regular procession, and following the leader whichever way he turned. I placed some large sheets of paper on the table; upon these the different groups were soon marching, and could be much more easily seen than when upon the darker table. I now, with a pencil, knocked the leader away from one line, and was surprised to see the next in the line, now the leader, stop when he reached the place occupied by the first leader prior to his removal.

* Riley, C. V., 'Fifth Missouri Report,' p. 128.

† Packard, A. S., 'Insects Injurious to Forest and Shade Trees,' Washington, 1890.

Here he stopped, and, raising himself upon his prolegs, moved the anterior part of his body to and fro, as if he were trying to scent the leader. He soon discontinued this, and resumed his natural position again, appearing, however, for some time very restless. While this had been going on the rest of the caterpillars had crowded up to the front one; they appeared for some time very restless, but finally settled in a close bunch, in which position they all remained. One here and one there would often become restless for a few minutes, but end by settling again in its former position in the bunch. I now marked the original leader (he had been kept away from the others all of this time) by putting a little white paint on his back, and then, picking him up on a small piece of paper, dropped him back at the edge of the group. The leader in the meantime had been walking around, evidently seeking the other caterpillars, and when he returned to the bunch began to walk restlessly around near its edge. In a few minutes he started off away from the others, and these began to follow him, moving in a regular procession.

"Different masses of the eggs were now brought into my room, a few each week, and when the caterpillars hatched a few experiments were carried on to see if the removal of the leader always affected the followers in the same way, and if a new caterpillar would not assume the leadership, and be followed by the rest. The results I have thought it best to write out briefly, and not to arrange them in a tabulated form. The first set contains those in which the old leader, upon being returned to the bunch, resumed command; and the second lot, those experiments in which a new caterpillar became the leader. There then follow a few experiments differing from those contained in the first two lots. When the number of caterpillars forming the line was counted, this is given; but in some cases, however, the number which formed the line was not noted.

"In nearly every instance the removal of the leader brought about at first the same result. When I removed him I would draw a line on the paper, marking a place where his head was before removal. When the second caterpillar in the line reached this point, he always stopped, rarely crossing the line; and when the bunch was formed it was always back of the line.

"1. Sixty-four in line. 8.15, leader removed; 8.80, all bunched; 8.81, leader returned; 8.85, all restless; 9.00, leader started, and at 9.08 all were in line and moving.

"2. Six in line. 8.45, leader removed, others soon bunched; 8.51, leader returned; 8.57, old leader started, others following.

"3. 8.47, leader removed; 8.50 all, bunched; 8.51, leader

returned ; he passed to back of bunch and started away, others following ; 8.48, all in line.

" 4. Ten in line. 8.81, leader removed, and all bunched one inch back of line ; 8.86, leader returned ; 8.55, leader starts, and others follow.

" 5. 8.57, leader removed and put back at once, seventh in the line ; all bunched ; 4.06 p.m., leader started, others following.

" 6. 8.16, leader removed ; 8.26, leader returned ; 8.81, leader started, others following.

" 7. 8.21, leader removed ; a caterpillar, the next in line, goes on half an inch, and here they all bunch ; 8.80, leader returned ; 8.42, leader starts, and others follow.

" 8. 2.82, leader removed ; 2.47, leader returned to bunch ; 8.55, leader started, others following.

" 9. One hundred and fifty in line. 10.22, leader removed ; 10.40, bunched, and leader returned ; 11.25, leader started, and others followed.

" The following are experiments where a new leader started :—

" 1. Forty in line. Leader removed ; 9.10, bunched ; 9.11, a caterpillar at back of bunch starts, and others follow.

" 2. Twenty-one in line. 9.01, leader removed ; 9.08, bunched ; 9.10, one near front starts ; 9.21, all in line, following new leader.

" 8. Eighteen in line. 8.50, leader removed ; in a minute the next caterpillar turned and started ; 8.55, all in line, and following new leader.

" 4. Thirty-six in line. 8.42, leader removed, and the next caterpillar assumes leadership ; 8.47, new leader removed, and original one put back in middle of line ; all bunch ; and at 4.08 p.m. were still quiet.

" 5. Eighteen in line. 8.80, leader removed ; 8.87, bunched ; one went a short distance over the line, but returned ; leader returned ; 8.46, new leader started, and others follow.

" 6. Eleven in line. 8.88, leader removed ; 8.41, next caterpillar returned along the line two inches, and then came back ; others bunched ; 8.45, start with new leader.

" 7. Ten in line. 10.84, leader removed ; line kept on ; 10.89, second leader removed ; march continued ; 10.40, third leader removed ; 10.42, bunched ; 10.48, started with the original leader, who had been returned, at head.

" 8. 8.18, leader removed ; 8.22, leader returned ; 8.56, new leader started, others following.

"9. 2.56, leader removed ; 8.05, leader returned ; 4.05, new leader started, and others follow.

"10. Forty-six in line. 9.24, leader removed ; 9.88, all bunched ; leader returned ; 10.05, new leader starts, and others follow.

"11. One hundred and twenty in line. 8.41, leader removed ; when the entire line had bunched the leader was returned ; 11.45, new leader starts, and others follow.

"12. One hundred and fifty in line. 8.48, leader removed ; 9.25, mostly bunched, and leader returned ; 10.10, old leader started, rest following ; they went more than an inch, and then returned to bunch again ; 2.30 p.m., a new leader starts, and others follow.

"The following experiments were made by removing the leaders of two lines, and then returning them each to the other's bunch :—

"A. Six in line. 2.02, leader removed ; 2.06, bunched ; leader of A' placed near head ; 2.08, leader of A' starts, and others follow.

"A'. Thirty-two in line. 2.02, leader removed ; 2.07, leader of A placed in bunch ; 2.11, one, not the leader, started, but returned ; 2.35, leader of A starts, and others follow.

"B. Thirty-two in line. 1.56, leader removed ; when others bunched, leader of B' placed with them ; 2.18, leader from B' starts, and others follow.

"B'. Thirty-five in line. 1.56, leader removed, and leader of B placed in bunch ; 2.08, leader of B starts, and others follow.

"C. 1.22, leader removed ; 1.27, leader of C' placed in bunch ; 8.20, line starts with entirely new leader.

"C'. 1.22, leader removed ; 1.27, leader of C placed in bunch. Called away, and unable to follow this to end.

"The following experiments I give separate from the others :—

"1. 8.24, leader removed ; 8.88, leader returned, and at once started out, the other caterpillars remaining in bunch ; 8.88, leader returned again ; 8.42, he starts out again, but none follow ; in two minutes he returns to the bunch himself, and starts a third time ; this time some follow, but soon return to bunch, and leader goes off by himself.

"2. Eighteen in line. 8.82, leader removed ; 8.88, bunched ; leader returned, and they remained in bunch all morning.

"3. Thirteen in line. Same thing happened as in No. 2.

"In one lot, thirty-six in line ; the leader had been marked, and the line allowed to go on. The leader reached the last caterpillar in the line, so that a circle was formed. They all kept moving, the leader finally reaching the place where he was when the circle was

first formed ; he then went half-way around the circle, and started off in another direction, the others following.

"From the above it will be seen that the removal of the leader affects the whole line, but that he is not necessary for the further progression of the caterpillars. I have been unable to find references to the procession-caterpillar, but notice that the caterpillars of *Saturnia io** march, when young, the same as the Maia-moth.

"Dubois† notes that the procession-caterpillar spins a thread which the others in the line follow ; the young larvæ of *Hemileuca* do the same, the thread being seen, with a hand lens, back of the line. In nearly all the long lines which the larvæ form, there is very apt to be at least one break where there is an inch or more between the nearest caterpillars, or such a break can be made by stopping one of the larvæ until the preceding ones have gone ahead for same distance ; at such a place the thread also can be seen. When a break occurs, it does not in any way affect the movements of the line, the caterpillars following along the regular path.

"Wishing to see how much the caterpillars depended upon this thread to enable them to follow in the exact path of the leader, I removed the thread a number of times when the distance between two neighbouring caterpillars was great enough, and found that the course was not in the least altered. The caterpillars, upon reaching the end of the broken thread, generally kept straight on as if nothing had been done, failing to show a dependence upon the thread alone in following the path of those ahead. I next removed the thread, and then, dipping a finger in water, rubbed it rapidly a number of times across the path, and then wiped the place dry. When the first caterpillar reached this spot he halted, and for three minutes remained at the same place, raising the anterior part of the body in the air, acting the same as if the leader had been removed. At the end of this time he started forward, following, as near as I could judge, the original path.

"The following few experiments should have been made with the food-plant of the caterpillar, but this being unobtainable at the time of the year when the caterpillars were hatching in my room, the leaf of the geranium (*Pelargonium*), which was easily obtained and possessed quite an odour, was used.

"1. A small piece of the leaf was placed 5 mm. away from a small group which had been quiet for two or three hours ; the caterpillars became at once restless, and in two minutes three had moved over and touched the leaf.

* Dickerson, Mary C., 'Moths and Butterflies,' 1901.

† Dubois, 'Ann. Soc. Linn. Lyon.' xli. 1900, p. 125.

"2. A small piece of the leaf was placed 5 mm. away from the leading caterpillars in a line; they became at once restless, and "broke rank"; in four minutes two (not the leader) had reached the leaf.

"3. A piece of leaf was placed 15 mm. from a group—nothing happened; the leaf was moved to 10 mm. and left for ten minutes—nothing occurred; moved to distance of 5 mm. from caterpillars, and all still remained quiet. I now moved the leaf to 8 mm. away; one immediately came out, touched the leaf, and returned to its original position; in thirty seconds another came out, touched the leaf, and returned.

"4. A piece of leaf was placed 5 mm. from group; two came out, touched it, and returned."

Madison, February, 1904.

ORNITHOLOGISTS' UNION FOR SOUTH AFRICA: A SUCCESSFUL START.—

"At six o'clock a number of gentlemen met in the Normal School, Pretoria, in response to a circular letter issued by Mr. A. K. Haagner. The object of the gathering was to form an Ornithological Union for South Africa, and the attendance, and number of letters received on the subject, proved that the time was a most opportune one.

Mr. W. L. Sclater, M.A., F.Z.S., presided, and representatives from all the South African Colonies were present. Mr. Sclater opened the proceedings by calling upon Mr. Haagner to read his report on what had been done. The report showed that forty gentlemen interested in the subject had sent in their names. These were divided amongst the Colonies as follows:—Transvaal, twenty-one; Cape Colony, twelve; Natal, four; Orange River Colony, two; Rhodesia, one.

Dr. Gunning, F.Z.S., proposed that an Ornithologists' Union for South Africa be formed, and that a committee be appointed to draw up rules, and to inquire into and report upon the possibility of publishing a journal. This was seconded by Mr. J. A. Bucknill, M.A., of Pretoria, and carried unanimously.

The Committee elected was as follows:—Mr. W. L. Sclater, M.A., F.Z.S. (Director, South African Museum, Capetown); Dr. J. W. B. Gunning, F.Z.S. (Director, Transvaal Museum and Zoological Gardens, Pretoria); Mr. J. A. Bucknill, M.A., Pretoria; Mr. A. D. Millar, Durban; Mr. W. Macdonald (Editor, 'Transvaal Agricultural Journal'), Pretoria; Mr. J. A. Alexander, F.R.S. Edin., Johannesburg; and Mr. A. K. Haagner, M.B.O.U., Modderfontein, Hon. Sec. *pro tem*. It was decided to leave the framing of rules and election of officers to a subsequent meeting.

Mr. W. L. Sclater then read an interesting paper on the history of similar societies, and the early South African pioneers of ornithology.

After a hearty vote of thanks to the chairman the meeting terminated."—*Transvaal Leader*, April 9th, 1904.

IN the 'Transactions of the Hull Scientific and Field Naturalists' Club' for 1908 is an interesting note on the "Dispersal of Shells by Beetles," by the Rev. E. P. Blackburn:—

"Early in August, 1908, a small party of conchologists visited Tibthorpe Wold, to the west of Driffeld. Near Mr. Piercy's farmhouse, at a height of nearly 400 ft., is a pond, the nearest water to which is half a mile away, and the next a mile away. It has been in use for some time, but, in common with other ponds on Sir Tatton Sykes' estate, is frequently cleaned out, and consequently did not appear very productive from a conchologist's point of view. About six years ago it was entirely emptied and relined. Application of the scoop, however, quickly brought up a host of *Pisidia*, with which the pond swarmed on one side, together with a number of small water-beetles, water-boatmen, and water-bugs. A few *Limnæa peregra* were put in the pond a year ago, but had not survived for want of food. Several of the beetles were observed with something on their feet in the pond, but it could not exactly be seen what. The *Pisidia* were brought home, and put in a basin with their native mud, and it was found that a number of water-bugs (*Corixa*) and beetles had been brought along with them. The next day we saw a bug (*Corixa*) in the bowl caught by the foot with a *pisidium*. A day or two later I was examining the contents of the bowl, and found three others caught. I killed the insects, and gummed them on a piece of paper. No. 1 had two *Pisidia* on two back legs. No. 2 had three shells attached, one a fairly large one. No. 8 is more perfect, and has two shells, one on each side. Two days later I found a lively little water-beetle caught, but he managed to get free. A fourth specimen, however, was secured with one *pisidium* attached. Wallis Kew (in 'The Dispersal of Shells'), after explaining how ponds, similar to the above, are stocked with *Pisidia* by means of flying insects, animals, &c., says:—"Some of our common water-boatmen are probably even stronger than the *Nepa*, or water-scorpion. I have once or twice seen them alight upon the surface of the ponds in the sunshine, fold their wings, and disappear in the water." With the specimens above mentioned, it is quite plain that ponds may be stocked very easily in the way described."



ORKNEY VOLE. *Microtus orcadensis*, Millais.



COMMON FIELD-VOLE. *Microtus agrestis*.

THE ZOOLOGIST

No. 757.—*July, 1904.*

ON A NEW BRITISH VOLE FROM THE ORKNEY ISLANDS.

BY J. G. MILLAIS.

RETURNING one evening from fishing in the Loch of Stennis, Pomona, Orkneys, in the month of August, 1886, I noticed what looked like a Water-Vole running swiftly along the sheep-track in front of me. The fact that the animal seemed to be quite black at once made me pause, for the distance from the lake was considerable, and I had never observed the black form of the Water-Vole in the Orkneys. The little beast presently darted into what I found on examination to be a large series of runs and tunnels intersecting the heather, grass, and small rocks, such as we are accustomed to find in the northern colonies of the Common Field-Vole. I saw at once that it must be a black variety of some Vole, and its size, which appeared to be twice that of the common species, led me to think that all the Orcadian Field-Voles might be melanic, and might also be a distinct species of the genus.

After sitting and waiting for an hour, I saw another of these Voles—a still larger specimen—also black; but, having no traps with me, and an engagement in the south, I was unable to capture a specimen that year. In the following August, however, a friend sent me two specimens in the flesh, one of which was russet-brown, and the other brownish black all over. I then saw that this Vole differed in many respects from *M. agrestis*. Now, too, I know that it differs from the smaller British species

in more marked degree than the recently discovered *E. skomerensis*, of Skomer, does from the Common Bank-Vole (*E. glareolus*) of Britain. Owing to the carelessness of a local taxidermist in Perth both these specimens were destroyed, but I had fortunately made a careful drawing of the black variety in the flesh, and I have since obtained and examined a large series of this Orcadian Vole. Mr. P. D. Malloch collected five adults for me in September, 1898, and Mr. Cursiter, of Kirkwall, has sent me specimens, living and dead, as I have required them. Most of these have been obtained from a large colony in the parish of Sandwick, Pomona, where they are especially numerous in the grass-fields.

Before passing on to a description of this new Vole, it may be as well to say a few words as to its habitat and habits. Pomona, the main island of the Orkneys, is a large wind-swept island of some twenty-six miles in length, and fourteen broad at its greatest breadth. The general aspect of the land consists, for the most part, of low rolling hills covered with rocks and heather; whilst the lower slopes and lands adjacent to the sea have been reclaimed for the purpose of agriculture, and consist chiefly of rushy fields, grass, and clover. For the greater part of the year the Orkney Vole inhabits these rough fields, and even the part-grass, part-heather uplands, where sheep feed, until in the summer and autumn, when they repair to the rich grass and clover fields which are under cultivation, doing here and there considerable damage to crops.

So far as I can learn, there has never been a plague of these Voles in Orkney, nor have they bred to anything like the same extent as the hordes that have done so much mischief in the south. In fact, the Orcadian Vole seems to be a strictly local mammal, and to a large number of the inhabitants it is not known at all.

In the neighbourhood of the Loch of Stennis it is fairly numerous, and especially so in the parish of Sandwick. I have seen the runs of these Voles quite near Kirkwall, and on the promontory of the mainland facing the island of Damsay, and in several other places. It exists, I believe, in all the islands of Orkney where grass and rough fields are to be found, except in Hoy, which is doubtless too peaty and rocky. Locally it is

known as "The Cuttick" or "Puttick," and large numbers are sometimes killed in August during the cutting of the hay.

In September, 1903, Mr. Cursiter sent me five of these Voles alive, and I kept them until the 15th of the following December, when a spaniel, who was accustomed to collect small mammals and bring them to me, finding business dull, upset the cage and released or swallowed four of them. At any rate, I found only one (a male) remaining when my faithful hound had finished his work. This specimen I kept until Feb. 10th, when I killed it for the sake of its pelage. Amongst these five was one big male, which measured $5\frac{1}{2}$ in. from nose to the root of the tail; tail, $1\frac{1}{4}$ in.; the largest and handsomest specimen I have seen. This loss was particularly distressful, not only on account of his remarkable size, but because he was so amiable a little beast. He never attempted to bite, and would sit up in my hand and eat a piece of carrot without fear, whilst strangers observed him. In confinement all these Voles were at first very shy and retiring, generally biting if roughly handled, but the males soon became tame, and I could then handle all three without fear of being bitten. The females were always much shyer and more pugnacious. Their high squeak could constantly be heard when others jostled them, or fresh food was put in the cage. The Voles devoured large quantities of grass when fresh and green. They also seemed to like brown bread, and an occasional nibble at a turnip; but next to grass their favourite food was carrots. The unconsumed blades of grass, though rejected as food as soon as they commenced to dry, were taken to one corner of the cage, and carefully interwoven into a large comfortable nest. In the centre of this the Voles would cuddle and sleep the greater part of the day, their usual attitude being three tucked closely together, whilst a fourth lay across the top, forming a warm fur coverlet.

On Dec. 2nd the temperature sank to 35° , and I noticed that the Voles did not touch the food placed for them. This cold snap lasted a few days, during which they neither fed nor moved; but on a rise of temperature they again appeared, and ravenously ate the food placed for them. These intervals of hibernation continued, in the case of the single male which I kept, until Feb. 10th, 1904.

The Orkney Vole, for which I propose the name of *Microtus orcadensis*, sp. nov., may be described as follows:—

GENERAL CHARACTERS.—*Size, in very large males, nearly double that of the Common Field-Vole; skull of adults about 26 mm., very strong, with large incisors; tail, 30 mm., short and well-haired; zygomata heavy. The long hair on the forehead stands up prominently in life. Ears large and well haired. The general appearance is massive; the muzzle being particularly blunt, with the strong incisors prominent. Skull of the adult male in millimetres:—Greatest length above, 26; base length, 24; palatal length, 15; zygomatic breadth, 17; brain-case, 12; length of molars, 6.5; length of nasals, 9. And the same may be said of the skulls of females. Total length from nose to root of tail, 125 mm. Hind foot, 20 mm.*

COLOUR.—*In full winter pelage the general colour of the upper parts is dull sandy brown. This effect is produced by upper and minor portion of the hairs being pale yellowish brown, with the long protruding hairs black. The major and hidden portion is slaty grey. The back hairs are very dense and long, measuring as much as 15 mm. Hair on cheeks and flanks having fewer black hairs, more sandy brown, inclining to russet, whilst the throat is again paler, and the whole of the under parts sandy rufous. Hair on the legs and feet pale sandy yellow. Demarcation between the upper and lower parts is only slightly defined. The ears are heavily haired on the inner ridge. This gradually ceases towards the top, whilst the inner surface of the ear itself is thinly covered with small sandy hairs. Tail well haired with yellowish hair possessing grey under parts. Both in adults and immatures a dark line is sometimes seen extending from the root to tip of the tail on the upper surface. The above describes the full winter pelage. In summer the coat of hair is not so dense, and rather more cinnamon-rufous all over. The immatures resemble the adults, except that the hair on the upper surface of the toes is often white.*

Dimensions in Millimetres.

<i>Adults, female and male</i>	<i>Head and body</i>	<i>Tail</i>	<i>Hind foot</i>	<i>Ear</i>
<i>Maximum</i>	<i>140</i>	<i>30</i>	<i>20</i>	<i>12</i>
<i>Mean</i>	<i>120</i>	<i>26</i>	<i>18</i>	<i>11</i>
<i>Minimum.....</i>	<i>115</i>	<i>22</i>	<i>16</i>	<i>10</i>

Measurements in Millimetres of Eight Specimens presented to the British Museum.

<i>Sex</i>	<i>Head and Body</i>	<i>Tail</i>	<i>Hind foot</i>	<i>Ear</i>	<i>Length of Skull</i>	<i>Breadth of Skull at Zygomata</i>
1. Male	140	25	20	12	broken	17
2. Female	135	25	16	12	broken	15
3. Male	130	30	17	11	broken	—
4. Female	130	26	16	11	broken	18
5. Male (type)*	120	25	20	11	27	17
6. Male	110	24	16	11	26	17
7. Immature male 8½ months ...	105	23	17	10	25	17
8. Immature female, 3½ mth.	90	20	18	9	26	15

On comparing the Orkney Vole with the common British species of Field-Vole, the most superficial observer will at once be struck by the superior size, the broad, blunt, and heavily furred head, and the difference in colour of the northern species. The incisor teeth also present a great difference in point of size; the molars, too, are of different pattern. A comparison, too, of the average measurements at once disposes of any close association. The following are the measurements in millimetres of a typical adult male British Field-Vole, taken in Sussex, December, 1908:—

<i>Sex</i>	<i>Head and Body</i>	<i>Tail</i>	<i>Hind foot</i>	<i>Ear</i>	<i>Length of Skull</i>	<i>Breadth of Skull at Zygomata</i>
Male.....	100 mm.	24	16	10	25	16

The sexes differ little in size.

It will be noticed therefore that while the average adult male Orcadian Vole is much larger than the Field-Vole of the mainland, there is still greater disproportion between maximum measurements. The only part of the animal which does not show this difference is the tail.

Without offering any opinion as to how this large Arctic Vole

* British Museum, No. 4. 6. 21. 1.

came to exist in this small group of islands whilst the species is totally absent from the Shetlands, and very different from that found in Scotland, only about twenty miles away, one must yet notice two curious zoological points. First, we are at once struck by the fact, instanced both in this case and that of the recently described Skomer (Bank) Vole, that here we have two boreal mammals, living in a small isolated island or islands situated close to a large island (Great Britain), and presenting in both cases much larger forms than the type living on the big island or continent, such as it must have been prior to the second insulation. Students of zoology are well aware that, almost without exception, types found on islands similar in all respects to those on the mainland are almost invariably *smaller*. Secondly, I would point out that the depth of the Pentland Firth is great, and its tideway one of the strongest in the world; so it is reasonable to suppose that the Orkneys were separated from Great Britain long before that country became an island, and were then possibly a promontory of Scandinavia. Why no boreal Vole is found in the Shetlands I cannot understand, but close search may yet discover it.

[At Mr. Millais's request, I have examined the specimens of *Microtus orcadensis*, and may say at once that it is a most distinct species, and one of the most interesting and unexpected discoveries ever made in British mammology. The exact relationships of *M. orcadensis* are by no means clear, and will need to be studied with a full knowledge of the continental species of the genus. From *M. agrestis* it differs not only by the characters pointed out by Mr. Millais, but by not possessing any trace of the fifth triangle to the second upper molar so characteristic of that species, while its skull is also peculiar both in shape and size. Yet it does not seem related either to the *M. ratticeps* or *M. arvalis* group. This animal thus presents a most interesting problem, both zoological and geographical.—OLDFIELD THOMAS.]

ICHTHYOLOGY IN JAPAN.

By Prof. McINTOSH, M.D., LL.D., F.R.S., &c.

THE changes which have taken place in the civilization of Japan within the last forty years have been emphasized in a remarkable degree in her scientific progress. The "silent and sentimental" people of Ehrenberg, who with quiet humour could first remove the sponge from the upper end of the Glass-rope Sponge, insert the denuded tip into a hole bored by *Pholas* in a rock, and sell the whole to the authorities of the British Museum as a "Glass Plant"—which grew out of the aperture, as it were wisp uppermost—have since that date achieved a reputation as able and original scientific inquirers. At first they acquired their scientific knowledge by emigration to the centres of western nations, or from skilled lecturers introduced into their own country. So seriously did they apply themselves to the task, that now their own nation supplies capable investigators and teachers in most departments, even in the Universities; whilst the encouragement given to Marine Laboratories and Marine Research in general would do credit to a European nation. The quaint and more or less imaginary representations of the fishes of Japan have given way to a new order of things, in which Fisheries' Research is being carried out in the Imperial Fisheries' Bureau of Tokyo, under Prof. Kishinouye and others, and the fauna of a sea which can produce an edible *Medusa* is one which invites investigation. One is, indeed, struck by the thorough manner in which the scientific investigation of the various commercial products of Japanese waters—such as fishes, trepangs, mollusks, annelids, corals, edible medusæ, and sponges—is carried out. It is an index to the enterprising nature of the people. These remarks have been suggested by the perusal of the popular work subsequently mentioned, as well as by the fine series of memoirs on the Teleosts of Japan, by David S. Jordan (who personally examined the Japanese waters) and

E. C. Starks; and on the Elasmobranchs, by the former and H. W. Fowler. A maritime country which harbours two novel deep-sea Sharks, one of which, according to Dr. A. S. Woodward,* the able palæontologist of the British Museum, is closely allied to *Scaphanorhynchus* of the Cretaceous period, is a land of promise in fishes.

The richness and variety of the fish-fauna of Japan is well known, more perhaps in foreign than in Japanese literature; hence the authors of the 'Fishes of Japan'† have ventured to publish part i. of a work "not only helpful to those who are interested in the subject, but also to give a general knowledge of their [fishes] character and habits to those who capture or consume them." They have accordingly selected for this part four species of marketable fishes, viz. *Lateolabrax* (*Percolabrax*) *japonicus*, C. & V., a kind of Sea-Perch; *Latilus sinensis*, Lacép., a kind of Weaver; *Gymnosarda affinis*, Cantor, a Bonito; and *Seriola quinqueradiata*, Tem. & Schl., a "Yellow-tail." Each of these is finely figured in colours from life by Kumataro Ito, formerly an artist in the Imperial Fisheries' Bureau, and it is only justice to say that they are exquisite representations, and do as much credit to the artist as to the lithographer.‡

Each species is scientifically described, its economic importance indicated, its local names, habits, spawning, and growth explained, and, lastly, the methods of capture in vogue detailed. Even remarks about the presence of ripe eggs in such as the Bonito (*Gymnosarda affinis*) are made—for example, that in June and July the ovaries are full of eggs, the size of which is about 0·7 mm. in diameter, and devoid of an oil-globule. The Bonito is extensively used either in the fresh or prepared condition. "It is dressed, boned, and cut into four long pieces or strips; then it is boiled and dried hard. . . . The viscera of the fish are cleaned, chopped, and made into a fish-sauce called *shivo-kara*

* I have to thank Dr. Woodward for his great courtesy when examining the Fish-Destroyers of former ages some years ago.

† *Fishes of Japan*. An Account principally of Economic Species. By Keinosuku Otaki, A.B. Tsunenobu Fujita, *Rigakushi*, *Nogakushi*, and Tadashi Higurashi. No. I. vol. i. Illustrated with five coloured plates, and with text-drawings of fishing gear and weirs. Shōkwabō, publishers, Nihonbashi, Tokyo, Japan. June, 1908.

‡ E. Koshiba, Tokyo.

(*shivo*=salt, *kara*=strong). The dried Bonito or *Katsu-bushi* is highly esteemed," and often given in presents on memorable occasions. Its excellence is shown by the similarity of the name to that of the highly esteemed soldier-class of Japan.

Besides the account of the food-fishes, there are four plates of fishing apparatus, with accompanying descriptions in Japanese. The first shows the structure of a seine-net—the floats being ingeniously fixed between a double cord—and the method of setting it. The second gives a graphic illustration of rod-(bamboo) fishing from a boat, and of an angular hook (without barb), as well as of artificial bait, the hook being in the midst of a tuft of filaments. The third represents a hand-line with neatly spliced sinker, and a hook of the ordinary kind; whilst the fourth gives a drawing of a line with sinker and barbed angular hook.

The work, of which this is the first part, does equal credit to the skill of the Japanese artists, and to the descriptive powers of the authors, and, with its English as well as Japanese text, cannot fail to interest Europeans, and to be of much service to the fishing industry in Japan. Slips, which might have been avoided by more careful supervision, occur in the English part, but fortunately no ambiguity is caused thereby. It might also have been well to allude to the history and uses of allied food-fishes in other countries. On the whole, the authors may be congratulated on their efforts to render their treatise both popular and reliable.

Gatty Marine Laboratory, St. Andrews University.

ORNITHOLOGICAL NOTES.

BY E. F. M. ELMS.

OBSERVATIONS AND NOTES ON BIRDS IN THE NEIGHBOURHOOD OF
NEW ROMNEY AND LITTLESTONE-ON-SEA, MAY 16TH-20TH,
1902.

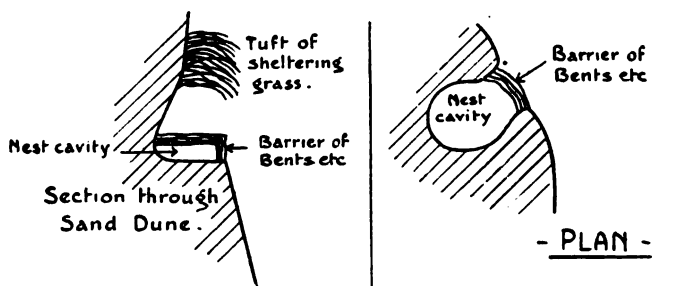
In the following notes the various species are not grouped together in any systematic manner, but simply in the order that the birds were observed.

MAY 17TH.

Anthus pratensis.—In the first tump of coarse grass that I came to on Great Stone Point, found a nest containing four newly-hatched Meadow-Pipits.

Totanus calidris.—Saw several Redshanks.

Linota cannabina.—Found a curious Linnet's nest (Grey Linnets they are called locally) in the side of a sand-bank, and ill-concealed. The four eggs rested simply in the sandy cavity, and to prevent them from falling out a frail barrier of bents and dead grass was constructed across the outer edge of the cup (*vide* diagrams).



Sterna minuta.—Saw a few Lesser Terns, which were evidently not yet nesting.

Aegialitis cantiana.—Whilst watching the Common Terns,

many of which were wheeling about over the shingle, a boy accosted me, and offered a clutch of four Kentish Plover's eggs for ten shillings. This I declined, since, if it comes to buying eggs, one can purchase those of the present species for about fivepence each at any naturalist's, though I suppose at that price they would not be "British." This fellow informed me that if I would not have them at ten shillings, he would send them to a man who would always give him twenty shillings for a clutch of Kentish Plover's eggs. This clutch was a great temptation to me, since I had not then, and have not now, any specimens in my collection; but I am happy to think, though I question whether I did any good in so doing, that I resisted the temptation of taking those eggs. It brought home very forcibly to me the appalling traffic in British-found eggs. These fellows keep a sharp eye on all eggs that have a value, and ruthlessly plunder every nest to satisfy the demands of the "collector." The fisherfolk are poor, and it is not their fault that they should seek a means of turning over a few shillings when possible; it is the collector who creates the demand, and an evil at the same time, and so long as a demand exists there must necessarily be those who will lay themselves open to satisfy it. Later in the day another boy brought me two eggs of the Common Tern ("Kips" they call them). As these birds are exceedingly common, I took them, though rather reluctantly. The youthful populace of this district are caddies, and when they are not filling this office they are relentless egg-hunters.

MAY 18TH.

Ægialitis hiaticola.—Saw the first Ringed Plovers about half-way between Littlestone and Dymchurch; watched them running about the shingle for some time, and felt convinced there was a nest near at hand, but was unable to locate it. They (for it was a pair under observation) seemed full of anxiety and uneasiness, and incessantly kept up their tremulous piping. After accomplishing each little run forward over the pebbles they would pause, and seem to cast a sidelong glance at one another.

Alauda arvensis.—Sky-Larks exceedingly numerous; in

fact, this species, the Meadow-Pipit, and the Wheatear were the most numerous birds in this district. Found a Sky-Lark's nest built in a hollow among a heap of stones on the roadside, containing four much incubated eggs. This species nested freely in convenient natural depressions sheltered by the grass growing at the sides of the roads. In the afternoon, whilst walking at the side of the road, almost trod on the parent bird, who flew up from my feet, disclosing four newly-hatched chicks. A repetition of the same thing occurred a few yards farther on, the nest containing three fresh eggs; and yet another with four fresh eggs. Besides these, several empty nests were discovered.

Pica rustica.—Romney Marsh is hardly suitable to the requirements of the crafty Magpie, as, comparatively speaking, it is a somewhat treeless district; but nevertheless a pair were observed, and the nest located. This was built about eight feet from the ground in the thickest part of a hedgerow running along the side of the road, and was composed of stoutish twigs and the usual formidable thorns. To those who once believed in the two species of Magpies—the one that built in a tree, and the other who placed its nest in a bush—this present case would doubtless furnish substantial evidence of a difference. The nest under consideration contained four of the usual eggs disposed symmetrically around a large stone!

Acrocephalus phragmitis.—Sedge-Warblers in large numbers among the ditch-reeds, incessantly uttering their chiding notes, but none seemed as yet to have eggs.

Emberiza schœniclus.—Reed-Buntings also very abundant. Found a nest containing five typical eggs built amongst the grasses of a ditch-bank, and within a few inches of the water-level.

Anthus pratensis.—A nest of four fresh eggs, well concealed in a dense tuft of coarse grass. My attention was drawn to it by the grasses being parted from one another, the result of the parent birds' continual ingress and egress to and from the nest itself.

Saxicola œnanthe.—A pretty conspicuous bird, and abundant throughout the district, more especially on the waste lands and the golf-links. Incubation had not apparently become general, and as a consequence very few birds flew up from their nesting-

holes. One nest only brought to light to-day, and contained five fresh eggs, slightly pear-shaped.

MAY 19TH.

A very objectionable day, with high winds and intermittent hailstorms.

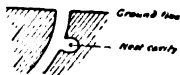
Ligurinus chloris.—Found a nest of the Greenfinch in a hedge-row with one egg only in it.

Turdus viscivorus.—Came across three Mistle-Thrushes' nests, all built in most conspicuous positions, and easy of access. They were all empty, and, as there were no fragments of egg-shells in any of them, it appeared that they must have been pilfered of their contents. One nest in particular had an extraordinary amount of sheep's wool in its composition—in fact, the builder evidently was completely nonplussed as how to properly use so large a piece, with the consequence that half of it was blowing about like a small flag—a very advertisement of the nest's whereabouts. In the evening observed several Ringed Plovers at Littlestone, and, a little later, approached quite closely two Redshanks, who were wading about in a shallow stream near the beach. When within about thirty yards of them they suddenly dashed up, uttering their sharp whistling notes, and flew away inland. A few Herring-Gulls straggling in from the sea, and flying in the direction of Dungeness.

MAY 20TH.

Saxicola ænanthe.—Flushed a Wheatear from small hole (certainly not a Rabbit-burrow) in some open and rather broken ground near the golf-links. Some withered stalks were scattered at the entrance to the hole, some just inside, but the nest itself was entirely invisible from the outside, and, if the soil had not been loose and giving, I doubt whether I should have tracked the nest at all. The nesting-cavity, containing a fairly compact structure—certainly more compact and bulky than was necessary in such a protected situation—was composed of dead grass, and lined with a little hair and wool. From the ground-line to the nest-cavity the distance was a good elbow's length, and the cavity itself was a *cul de sac*, branching out of the main hole (see diagram).

This clutch was one of six eggs, and they were of a much sturdier build than those I had the day before yesterday. Wheatears are called "Wagtails" by the local boys.



Agialitis hiaticola.—Spent a considerable time watching a pair of Ring-Plovers at exactly the same spot where I saw them on the 18th; they were probably the same pair. Their incessant cry or whistle was a plaintive "pip-pip" or "wip-wip," I could not determine which. This I took to be the note of anxiety, and was repeated quite incessantly. Only two or three times during the half-hour I watched them did the note change, and then it was "purliu" or "wurliu." At each utterance the black crescent-like gorget heaved up and down, and my friend thought the piping note was produced without any opening of the mandibles, but I could not ascertain this myself. So quickly did their little feet move over the pebbles, that every now and then a faint clatter was audible as a stone was overturned. From this habit of theirs they gain the local cognomen of "Stone-runner." Only two or three times did either bird pick anything up in its beak; they were evidently not intent on feeding. Their attitude all along was that of anxiety. Every now and then one would stop and perch itself on the top of one of the larger stones, and proceed to scratch its beak or head with its foot, and as often as not almost toppling over in its endeavours to preen itself and maintain its balance on one foot at the same time. Now one bird begins to move—in a series of short sharp runs from one end of a pebbly ridge to the other—say, about twenty yards, and gradually it comes nearer, and it strikes me that it is zigzagging, or rather, perhaps, lessened the distance between itself and me by a series of ever-decreasing radii, with the nest as the centre. Such proves more or less to be the case, for, on rising and looking carefully over these thousands and thousands of pebbles, I almost tread on the motionless squatting form of a Ring-Plover chick. It seems a weakling, and likely to die, but doubtless it has only been hatched a few hours. I doubt whether the hollow in which it

lay was the true nest; and where were the other three? The old birds, though exceedingly clamorous with their pipings, did not in any way feign injury or attempt to draw us away from their helpless young one, in the manner that so many species in this order are in the habit of doing. The eggs of the Ringed Plover are most difficult to find, and one might look over acres of this shingly waste without finding a nest; but, curiously enough, though one hollow on the beach would seem as good as any other, the birds appear to have their own particular favourite spots, and if one is "in the know" it is far easier to find them. The fishermen's lads know exactly in which part of the beach to look for the nests, and are quite adepts at it. The pebbles among which the eggs repose exactly match the buffish-brown ground colouring of the eggs, and, furthermore, the pebbles in many cases bear black or very dark spottings and markings, almost exactly like those on the egg-shells; in fact, several times I stooped to pick up a pebble that was so much like an egg that I was temporarily deceived.

NOTES ON THE NESTING OF THE MOORHEN (*Gallinula chloropus*)
AND THE LITTLE GREBE (*Podiceps fluviatilis*). RIVER ISIS,
BABLOCKHYTHE, OXON, MAY 20TH-24TH, 1904.

WHILST staying at the above place, I found and examined some twenty-five Moorhens' nests, and I now have pleasure in recording my observations noted on the spot. As might have been expected at this time of year, the various nests ranged from incomplete structures, through others containing eggs in all stages of incubation, up to those having newly-hatched chicks. Two or three nests were built among aquatic herbage at the side of the river-bank, one on the branch of a willow flung down into shallow water, and resting on the river-bed, but the majority were constructed among tall reeds. These latter nests are especially noteworthy from the fact that in every case the reeds immediately surrounding the nest were bent down and carelessly interlaced, forming, as it were, a kind of bower over the sitting

bird. I presume that the parent birds must do this, and if so the reason is not apparent to me. One might have been inclined to suppose that the birds used this device whereby they might conceal to a certain extent their conspicuous eggs, but this bower-like contrivance is far too scanty to effectually screen the eggs from the keen eyesight of marauding Magpies, Jackdaws, and the like.

Two other nests presented peculiarities on account of their sites, neither of which were unique, but nevertheless not very often met with. The first one was built in the centre of a thick May-bush, some four or five feet up, and overhanging the water. It was a large flattish structure, flimsily built of last year's hay, which was floated away in the terrible floods of June, 1903, and may now be seen caught in the hedgerows all around these Thames meadows. As I approached I observed two Moorhens slyly sneaking off through the long grass, and am quite convinced that this nest was shared by both of them. The nest contained no fewer than twelve eggs, of which five were in a different state of incubation from the remaining seven; thus five were very slightly turned, and seven were much more incubated, but nevertheless blew quite easily. The second curious nest was situated on the crown of a willow overhanging the river, and about twelve feet above it. The nest was merely a few pieces of dead rushes, on which as yet one egg only reposed.

The majority of the nests were well constructed with dead rushes, a few with green rushes, and one had a great many long twigs in its composition.

I examined seventy-nine Moorhens' eggs, and, so far as I could judge by just cursorily looking at them from the boat, there were only two distinct types. In all the disposition and colour of the markings were as usual, being somewhat sparingly spotted with ruddy, almost orange-brown, with a few underlying grey spots; but there were two different kinds of ground colourings, one type being a cold clay colour, the other a warm stone colour, with a suggestion of ruddy suffusion in it.

As regards the various complements of eggs, the nest already mentioned holding twelve was easily the largest clutch. Of the remainder, one contained nine eggs, two contained eight each, and several six each. Many held from one to five each, in which cases laying had not been finished.

I saw two or three families scuttling about among the reed-patches, but came upon only one nest where the young were just hatching. On the approach of our skiff the parent flew across to the opposite bank, and set up a most plaintive cry, almost a piping; but at last, gaining confidence, or from sheer anxiety for her offspring, she sedately paddled her way back, coming quite near to the boat. In the meantime some three or four black, downy little chicks scrambled over the rim of the nest-cup into the water, leaving behind three "chipping" eggs. The inmate of one was crying loudly, and fretting with its beak at a perforation in the shelly walls of its prison. With great care I contributed to its freedom by paring off more of the shell, when with one supreme effort the youngster wriggled forth, and squatted in the nest-cup. Although so young, the chicks in the water were possessed of considerable temerity, and came along, their already long-toed feet working vigorously, aiding themselves with their little stumps of wings. So fearless were they that they swam on the palm of my hand, and, fearing that they might be hurt by the boat, I placed them among the reeds, and pushed off, much to the relief of the parent no doubt, who now scurried about in the tangle collecting her brood.

Within three yards of this interesting family was moored the wet oozy collection of vegetable-matter that does duty as a nest for the Little Grebe or Dabchick. Altogether, I found eight Dabchicks' nests, and these, like the Moorhens', contained eggs in all stages of incubation, whilst one family was observed attended by the parents. The most usual number for a clutch seems to be three, but one nest contained four. In every case the eggs were covered with wet weeds. I was fortunate in seeing one Little Grebe carrying out this pretty deceit, which is one, I should imagine, that answers very well, so far as marauding mammals, birds, and reptiles are concerned. I saw this particular Grebe get up on its nest, deftly pulling on a coverlet of weeds as it did so, and at once dive into the tangle at the margin of the river. No doubt this covering is to hide the conspicuous eggs from the sharp eyes of egg-stealing birds, &c., and it may also serve to keep them warm, for I noticed that all the nests were very warm to the touch. Some of the nests were built of fresher materials, and consequently the eggs were only stained

to a creamy colour. One, however, was composed of decaying vegetable-matter, well-coated with slimy mud, and evidently procured from the river-bed, and the eggs in it, although nearly fresh, were most hopelessly stained and muddied. As I was in need of some Little Grebe's eggs, I took three of the clutches, particulars of which I append:—

Clutch No. 1, containing three.—Very stained and ingrained with mud; all rather spindle-shaped, only slightly incubated. No. 1. Length, $1\frac{1}{2}$ in.; width, $\frac{1}{8}$ in. No. 2. Length, $1\frac{2}{8}$ in.; width, $1\frac{1}{8}$ in. No. 3. Length, $1\frac{2}{8}$ in.; width, 1 in.

Clutch No. 2, containing three.—Chalky white, somewhat stained; all rather spindle-shaped, and having a decided point at either end; quite fresh. No. 1. Length, $1\frac{1}{2}$ in.; width $\frac{1}{8}$ in. No. 2. Length, $1\frac{7}{8}$ in.; width, $\frac{1}{8}$ in. No. 3. Length, $1\frac{3}{8}$ in.; width, $\frac{1}{8}$ in.

Clutch No. 3, containing four.—Slightly stained to a brownish creamy colour; rather more truly oval than last, but nevertheless having a more or less defined point at either end; quite fresh. No. 1. Length, $1\frac{1}{2}$ in.; width, 1 in. No. 2. Length, $1\frac{7}{8}$ in.; width, 1 in. No. 3. Length, $1\frac{2}{8}$ in.; width, 1 in. No. 4. Length, $1\frac{1}{2}$ in.; width, $\frac{1}{8}$ in.

I had two Sky-Lark's eggs brought in for me, one of which was an aberrant type. In shape it is most pyriform, having a far more accentuated pear-shape than any Plover's egg. In colour and markings it is normal, except that on the point of the small end the markings are absent, the result being a dingy white area.





NEST OF LONG-EARED OWL (*Asio otus*). Cf. p. 259.

NESTING OF THE LONG-EARED OWL (*ASIO OTUS*) ON THE GROUND.

BY ROBERT J. HOWARD.

(PLATE III.)

THE Long-eared Owl so seldom nests on the ground that proof of its having so nested is of interest. Mr. Stevenson ('Birds of Norfolk,' pp. 46-7) says :—"Mr. Spalding, of Westleton, informs me that on one occasion he knew of a Long-eared Owl snared on her nest, which was placed amongst the heather at the foot of a fir-tree." Col. L. H. Irby states that on May 10th, 1897, Mr. Ogilvie Grant and Capt. Savile Reid found a nest on the ground on an island in Loch Syne, Sutherland ('Ann. Scottish Nat. Hist.' 1898, p. 50).

Although, in the neighbourhood of Blackburn, the Tawny Owl has, to my knowledge, been met with in small numbers for the past eleven years, and has nested in Witton Park, where it is carefully protected by the owner, Capt. Feilden, the Long-eared Owl has not occurred, I think, nearer than some woods in the Ribble valley, about ten miles distant. On the 25th March last I saw a pair of these birds perched in larches five yards apart, not far from the top of Billinge, a hill in Witton Park, whose sides are well clothed with timber—Scots pine, larch, &c.—and whose heather- and bracken-covered summit is 807 ft. above sea-level. Judging from the quantity of castings, which were composed almost entirely of the remains of Sparrows and Chaffinches, the Owls must have used these perches for several weeks. A few days after the date named only one bird was seen in the tree, so a careful look-out was kept on the Wood-Pigeons' nests, of which there are a considerable number on the hill. On April 27th the headkeeper told me that, when searching for Pheasants' eggs, he found the Owl nesting *on the ground* amongst the bracken, forty yards from her old perch. I visited the nest several times, but never put the old bird off, and did not see the

young until May 14th, on which day I took a friend, an amateur photographer, who was successful in getting some good negatives of the old bird with the three young by her side. Several stems of dead bracken interfered somewhat with a good view of the birds, so, after the exposure of the first plate, we carefully removed them, the old bird remaining motionless whilst I crawled near and took with my hand a stem from within two feet of her face. Five days later we paid another visit with the camera. The old cock occupied his usual perch; the hen we soon located, by the help of some Blackbirds, a hundred yards away. One young bird was in the nest; a second had strayed about ten yards—this we returned to the nest to be photographed; the third we could not discover, but we found an addled egg close to the nest. The young birds' plaintive whistle soon brought the old ones into the trees near; the hen at first was very excited, and flapped from tree to tree with a hoarse "wack, wack"; but finally she perched in an oak a score of yards away, and watched us intently whilst we stayed, her brilliant orange eyes showing distinctly even without the aid of the field-glass.

As indicating the variety of species of birds which may be attracted, by giving them protection, together with suitable surroundings, I may state that in Witton Park—which is close to a busy manufacturing town of 130,000 inhabitants, and no part of which is more than two miles from the Town Hall—I have met with the following birds, in addition to the species common to the district:—The Hawfinch, Nightjar, Great Spotted Woodpecker, Long-eared Owl, Tawny Owl, Stock-Dove, and Common Sandpiper breed in the Park; the Blackcap, Pied Flycatcher, Crossbill, Dunlin, and Little Grebe are occasionally met with; a Common Buzzard frequented Billinge from November, 1886, until March, 1887, when it left, presumably for its breeding-quarters; the Merlin frequently gives us a call—and occasionally a good flight at Thrush or Redwing—on its way to and from the adjoining moors, where it still nests; Herons may be seen throughout the year; Kingfishers visit the reservoirs during the autumn months; in late autumn a few Grouse, driven from the neighbouring moors, drop on the heather-covered top of Billinge; and here we meet with Snipe, Jack-Snipe, and Woodcock, the

good under-cover, in the shape of bracken and rhododendrons, making Billinge a noted place for the latter bird. Mallard are hand-reared in the Park, but migrants come from the Ribble estuary, following the course of this river and of the Darwen; whilst Wigeon, Teal, and Golden-eye visit us more or less frequently. Pochard and Tufted Duck occasionally come to the ponds, but I think they are birds reared in the Corporation Park which have not been pinioned; consequently these are not molested. Herring, Lesser Black-backed, and Black-headed Gulls, chiefly immature birds, are here, more or less, the year round.

NOTES AND QUERIES.

MAMMALIA.

Barbastelle in Wales.—On June 18th I received, from the Rev. D. Edmondes Owen, two Bats for identification, which I was surprised to find were the Barbastelle (*Synotus barbastellus*). They were obtained in the churchyard at Llanelwedd, which is in Radnorshire, though close to Builth. Both these are adult males, measuring from snout to end of tail $8\frac{1}{2}$ in. The fur, which is very long and silky, is dark brown (*not* black), with whitish tips, these last being much longer below than above, so that the back looks dark grey; the under parts light grey. The tail is decurved, so as to form, with its membrane, a pouch, but it is much less bony than in other *Vespertilionidae*. I am depositing one of the specimens (which is being made into a skin by Mr. Ruskin Butterfield) in the British Museum. — H. E. FORREST (Hillside, Bayston Hill, Shrewsbury).

AVES.

Blackbird singing on a Chimney-pot in a London Road.—On May 21st, whilst walking along Marquess Road, N., I observed a Blackbird (*Turdus merula*) singing from a chimney-pot. To me this appeared an unusual proceeding, and I should be much interested to hear whether there are any similar instances on record. — T. EDWARD BELCHER (24, Clephane Road, Canonbury, N.).

[This is probably not an unusual occurrence. Some six weeks ago I observed a Thrush several times singing from a similar post of observation in the Selhurst Road, South Norwood.—ED.]

Occurrence of the Bluethroat (*Cyanecula suecica*) near London.—On June 17th I saw this bird at Sheen Common, not more than eight miles out of London, just off the road to Richmond. What struck me first was the beautiful band of light blue round the throat of the bird as it settled on a fence within a few yards of where I stood. I have no doubt whatever as to its identification, as the light blue throat and the otherwise dull brown colouration prevents its being confounded with any other species. The spot in the middle of the throat, whether red or white, was very indistinct, otherwise I should have noticed it at

so short a distance ; but most probably it belonged to the red-spotted species (*C. suecica*), as the white-spotted variety (*C. wolfi*) has only once been authentically recorded from this country, one having been picked up dead near Dungeness Lighthouse on Oct. 6th, 1902 (Zool. 1902, p. 464). According to the late Mr. Seebohm, in his 'History of British Birds,' i. p. 270, this species has been recorded from Newcastle-on-Tyne, Dorsetshire, Birmingham, Yarmouth, Margate, the Isle of Sheppy, Whimble (South Devon), Worthing, Lowestoft, Somerset, Brighton, off Aberdeen, and also a female from Spurn Point, procured by Mr. Eagle Clarke. Mr. Howard Saunders also mentions the visit to Norfolk of a flock of these birds in September, 1888, and again in the same month of the following year ('Manual of British Birds,' p. 85, 1899). In 'The Zoologist,' 1908, p. 389, a specimen is recorded from near Eastbourne, caught in September. — ERNEST C. CHUBB (Natural History Museum, S.W.).

British Examples of the White-spotted Bluethroat (*Cyanecula wolff*).—As was the case last year, I have only just returned from an expedition abroad, and therefore have not seen Mr. Nelson's note (*ante*, p. 81) until recently. I again refer Mr. Nelson to Mr. Dresser's 'Manual of Palearctic Birds,' p. 62, in which the author says, in describing the female and young of the red-spotted form :—"The female and young resemble those of that species (*C. wolff*), there being no characters by which they are distinguishable." If Mr. Nelson examines skins of the two forms, I think he will find that the females of both have a white spot or patch in the centre of the throat. If the specimen picked up at Scarborough in 1880 is an example of *Cyanecula wolff*, I venture to think its sex has not been ascertained correctly, as I believe I am right in saying that the females of both forms of Bluethroat never have blue throats, but only a collar of blue across the upper breast, and that only in comparatively old birds. In conclusion, may I ask if the specimen in question is still in existence, as if it is a female *C. wolff*, with a blue throat, it would be of some interest ?—MICHAEL J. NICOLL (10, Charles Road, St. Leonards-on-Sea).

Robin nesting in Tree and Hedge.—In 'The Zoologist' (*ante*, p. 190), Mr. Ellison recorded an instance of *Erithacus rubecula* nesting in a tree. I have never seen a nest among the leaves of a tree, but a year or two ago I found one in a hedge about three feet from the ground. I have also known this bird to build in a hole in the trunk of a tree at about four feet from the ground. — CHAS. H. BENTHAM (London Road, Redhill, Surrey).

Early nesting of the Lesser Whitethroat.—With reference to the note (*ante*, p. 227) on the early nesting of this species (*Sylvia curruca*) in Surrey, I may mention that on May 6th, 1902, I found a nest containing five eggs near this town, incubation having commenced. This nest therefore must have been built in April. Although the Lesser Whitethroat does not arrive here before the Common Whitethroat, it is nevertheless an earlier breeder; and in this part of Cheshire it is, some years, quite as common a bird, and apparently increasing in numbers. Only once have I found a nest with six eggs, but, as a rule, five—seldom less—seem to be the usual number. There is little doubt that, like the Common Whitethroat, it is very often double-brooded; I have seen half-fledged young in the nest as late as August 5th, and not infrequently on the wing in July. The construction of the nest resembles more closely that of the Blackcap than any of the genus, and the site also is often very similar; it is sometimes placed, however, higher up; one that I saw a few years ago was at least six feet from the ground, in a hazel-bush entwined with honeysuckle. It is a question as to which is the song proper of this bird, for the low warbling notes, distinct and varied—when one is close enough to hear them—are much more in the nature of a song than the well-known monotonous trill generally heard. I have often wondered how the curious “zip, zip” call is produced, a sound impossible to transmit to paper, and one that can hardly be associated with a bird at all, so singular is it. Besides the alarm-note, “toheck, toheck,” it has another cry less frequently heard, a continuous harsh “tchr-r-r-r-r” of some seconds’ duration, which it gives vent to when nest or young are approached too closely.—S. G. CUMMINGS (Chester).

The Cuckoo in 1904: interesting Incident with a Young Bird.—The Cuckoo (*Cuculus canorus*) was heard in the surrounding districts from May 1st and onwards, but was only heard on my immediate ground on May 8th, and was then present in fair numbers, though perhaps not so numerous as in some other years. I found a Twite’s (*Linota flavirostris*) nest on May 25th, with one young Cuckoo and two young Twites, about three days out of the shell. The former was very like the latter, but the mouth being larger. On the 27th there was no vestige of the young Twites, and on the 29th the young Cuckoo was dead, lying about eighteen inches from the nest. Two conclusions may be entertained at least on this question, one being the death of the foster-parent, and that some spasmodic action, through hunger, may have caused the young bird to spring out of the nest, near which I found a dead Twite. The other conclusion is that some, or the

adult Cuckoo, had removed the young Cuckoo out of the nest. It is also possible that the Twite might have been destroyed in a disturbance over the interference with the young. No animal had interfered with the dead body up to June 5th, though it had been exposed to the scorching sun all that time. By the 6th the bones were all clean picked, and it seemed that the flesh had been left untouched until it had reached a certain stage of decay. I examined the skeleton on the 7th, and saw that it had been carefully picked. There is no proof that the dead Twite referred to above had any connection with the nest, but I am strongly of opinion that the Cuckoo may have been the eater of the flesh, and a Cuckoo seemed to be very interested during my visits; but we have no direct proof of its doing so, and it was strange that the body was left untouched so long.—W. WILSON (Alford, Aberdeen).

Long-eared Owl (*Asio otus*) at Esher. — On June 8th I came across the nest of this Owl in Claremont Woods. The young birds had evidently flown, as there were only castings in the nest (which, by the way, was an old Squirrel's drey). One of the old birds was there, however, sitting on a small fir-tree close by. The castings at the foot of the tree consisted of the remains of small birds. There were also a half-eaten Rabbit and Squirrel. These birds would not be desirable tenants to have in a game-preserve, as I should imagine they would play sad havoc with young Pheasants and Partridges.—GORDON DALGLISH (29, Larkfield Road, Richmond, Surrey).

Nesting of the Ringed Plover (*Ægialitis hiaticola*). — In 'The Zoologist' (*ante*, p. 178), Mr. Hepburn calls attention to lined and partially concealed nests of the Ringed Plover, suggesting a gradual alteration in the nesting habits of this bird. I have had ample opportunities of observing the nesting of this species for several years, and have come to the conclusion that it is in a transitional state in regard to nest-building (see notes, Zool. 1902, p. 28; 1908, p. 198). Alas! several houses have lately been built near their old breeding-grounds, where formerly they nested abundantly, and now I seek their nests on a distant gravel sea-bank, where the Ringed Plover still nests freely. Here, last year, I found a nest with two eggs in a little depression scooped in sand, and hidden among coarse grass. Frequently the eggs are laid in fields of sprouting wheat, peas, &c., and become hidden before hatching by the growth of the crop. I wish again to call attention to the fact that exceptionally the Ringed Plover incubates her eggs when they are not placed in the normal position, *viz.* pointed ends turned inward. A short time ago I found a nest with four eggs, two placed normally, one pointed sideway, the fourth pointed to the

edge of the nest. I photographed this nest, retired some distance, and lay concealed. Very soon, with my glasses, I observed the parent run back to the nest, and settle down on the eggs. I let her sit for an hour, and again examined the nest, and found the eggs still in the same position described above, and again in the same position after another lapse of an hour or two. A new colony of Little Terns (*Sterna minuta*) established itself last season on this nesting-ground of the Ringed Plover, and successfully reared a few young. This year they have returned. I found some of their nests, with eggs, on June 28rd, and watched a series of encounters between a Ringed Plover and Lesser Tern; the latter kept again and again alighting, after a short flight, close to the nest of the former. The Tern was successful in driving the Plover away in every instance, with one exception, when the Plover made a furious run, with neck drawn in, upon its graceful opponent, which, taken by surprise, flew off screaming.—J. E. H. KELSO (Southsea).

Buffon's Skua (*Stercorarius parasiticus*) at Aberdeen. — A pair (male and female) were shot near New Pitstigo on May 28rd, by Mr. Campbell, who sent them to me for identification. This is the fourth time I have seen the species within this district during the past forty-two years.—Geo. SIM (52, Castle Street, Aberdeen).

Erroneous Record of the Eared Grebe (*Podiceps nigricollis*) breeding in Middlesex.—In Mr. Harting's 'Birds of Middlesex,' p. 244, it is stated that in the 'British Miscellany' (p. 19, t. 70) there is a representation of a male and female of the Eared Grebe, accompanied by the nest and eggs, which were taken in pond on Chelsea Common in June, 1805. As this statement is referred to (in an editorial note) in 'The Zoologist,' 1892, p. 426, and again more recently in the second edition of this author's 'Handbook of British Birds,' p. 269, it will be as well to point out that a mistake has been made in the identification of the birds figured by Sowerby in the 'British Miscellany.' On turning to this work (t. 70) it will at once be seen that the birds there figured are not Eared Grebes, but merely Little Grebes in summer plumage. The birds in question are called by Sowerby "the Small Black-chinned Grebe (*Colymbus hebridicus* ?)". And in his description of the examples in question (after quoting Pennant's description of the Black-chinned Grebe, then supposed to be a distinct species from the Little Grebe), Sowerby says that they are rather less than the Dobchick (*sic*), being only eight inches in length; the bill not quite one inch; chin black or dark brown. "The rest is pretty well expressed in the figure," in which the neck is reddish, and not black, as in the Eared Grebe.

Pennant describes the fore part of the neck of the Black-chinned Grebe as ferruginous. Sowerby's book was issued in 1804-6. In 1818 Montagu expressed an opinion that the birds figured on the plate before referred to, and other examples, were no other than unusually dark varieties of the Little Grebe ('Supplement to the Ornithological Dictionary'). The seasonal changes which Grebes undergo were not at that date properly understood, but the accurate Montagu (probably, having regard to his opportunities, the best ornithologist this country ever produced) was on the right track, and stated, in the work quoted above, that the Little Grebe and the "supposed species" called the Black-chin Grebe were connected by birds in all the intermediate stages of plumage. Neither Sowerby nor Montagu referred the Chelsea examples to any other species than the Black-chinned Grebe, now known to be the Little Grebe, to which species the birds figured on t. 70 of the 'British Miscellany' undoubtedly belong. — O. V. AFLIN (Bloxham, Oxon).

Notes on Nest-Boxes.—During the past season we have had in our nest-boxes, drain-pipes, &c., Great Tits, Blue Tits, Nuthatches, Tree-Sparrows, House-Sparrows, Starlings, and one brood of Wrynecks. The increase of Tree-Sparrows during the last few years is remarkable, as during the first seven or eight years after coming here in 1887, I did not see a nest or an egg, and this year at least six boxes have been occupied by these little birds. One pair of Great Tits brought off a family in a House-Sparrow's nest of which they took possession. The Wryneck's nest was in an old box which I had forgotten, and I did not see it till the young were hatched. One must see "Mrs. Wryneck at Home," with the lid of her dwelling removed, to appreciate the accuracy of the name, the contortions of the creature's neck and body under those conditions being most interesting. I have seen a friend take down one of his boxes in which a Wryneck was sitting on her eggs, lift off the lid, exhibit the occupant, and hang her up again without her flying off. A few days ago I found five adult Great Tits in a box occupied earlier in the year by Starlings, and more than once, in examining a Tree-Sparrow's nest, I have found the large Red-tailed Bee in possession. On one occasion I killed a green Hornet in an old weather-beaten box, of which the wood had become soft and decayed. — JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

Migratory Notes, &c., for May and June.—Cuckoo (*Cuculus canorus*) first heard around here on May 1st, and heard to about the end of June; Corn-Crake (*Crex pratensis*) on May 15th; Swallows (*Hirundo*

rustica) on May 16th; Warblers on May 16th, but not numerous; Larks to about the 15th—that is, in full song. Whinchat (*Pratincola rubetra*) I did not see before June 24th. It will be interesting to learn whether this bird has been less numerous in other places as well as here; they were back in numbers in 1908. Corn-Crakes seem to be earlier than usual.—W. WILSON (Alford, Aberdeen, N.B.).

PISCES.

Gadus poutassou at Aberdeen.—A male, eleven inches long, was caught by trawl one hundred and forty miles north-east by east of Aberdeen, in eighty fathoms of water, May 26th, by Mr. Herbert Howell, who kindly presented it to me. Its lower jaw is rather the longest; there are teeth of irregular size in both jaws, and four teeth on the anterior of the vomer, two on each side of the angle. These teeth are rather larger than those on the jaws, and somewhat obtuse. Couch says, "At the roof of the mouth a pair of prominent, sharp, incurved teeth." This would show that the number is not constant. Eyes large, which would indicate its being a deep-sea form. The stomach has nine high rounded ridges, that run longitudinally its whole length. Cæcal appendages eleven.—Geo. SIM (52, Castle Street, Aberdeen).

Large Salmon (*Salmo salar*) in the Hampshire Avon.—As I anticipated in a former note (*ante*, p. 145), more Salmon have been seen and taken during this season than for several years past, especially in the higher portions of the river, four fine fish having been caught in the water between Ringwood and Fordingbridge. Anglers were not very successful with the "fly," but after May 1st, when the "prawn" was used, more fish were taken in the local waters, a visiting angler landing four or five fish, in an equal number of days, ranging from sixteen to thirty pounds; but on May 20th a resident fisherman took a clean run fish which turned the scale at forty-six pounds, was fifty inches long, and twenty-five inches in girth. I am ignorant of the weight of Salmon which have been taken lower down, or at the mouth of the river, but I think the above weight is the "record" for this immediate neighbourhood. As a juvenile angler, I well recollect what large numbers of young Salmon—called "Salmon-peel"—were frequently seen in the river, and, "biting" so freely, how easily they were caught; and I have known Salmon to be found occasionally in the brooks of the forest, having no doubt ascended when the river was in flood; but I have not heard of such an occurrence for many

years past, perhaps on account of the continued lowness of the river, and some anglers to whom I have mentioned it even scouted the idea of this "king of fresh-water fish" being found in such a situation; but on one occasion I remember hearing some workmen relate how they found a large Salmon in one of the pools of a brook that was fast drying up, and, being at a loss to know how to capture it, they borrowed a hay-fork from the neighbouring farm, and thus secured the prize. I have often heard the assertion that Salmon from the Avon invariably fetches a higher price, if put on the market, than fish from other localities, but, if it is the case, I know not the reason why.—G. B. CORBIN (Ringwood).

[Frank Buckland, in his 'Nat. Hist. Brit. Fishes,' records the capture of a Salmon in the Avon at Christchurch, which weighed 58 lb., and measured 4 ft. 4½ in. in length by 2½ ft. in girth. He adds: "Mr. Tucker, of Christchurch, tells me that there is no record of any Christchurch Salmon hitherto having been taken over 47 lb." This fish was taken on April 2nd, 1880."—ED.]

EDITORIAL GLEANINGS.

WE heartily welcome the first number of a new Quarterly—the ‘Bradford Scientific Journal’—which can be obtained from the Hon. Sec. at 15, Godwin Street, Bradford. A paper entitled “A Study in Rooks,” by E. Harper, is of considerable interest, and we give very full extracts from same:—

“It has been known, although by no means generally, that Rooks do not stay to roost in their rookery through the winter. Gilbert White, in his delightful ‘Natural History of Selborne,’ records, over a hundred years ago, that the Rooks of that district retired for the night to the beech-woods of Tisted and Ropley; and, coming nearer home, Waterton also recorded that the Rooks in the neighbourhood of Nostell Priory gathered up there to roost in such vast numbers, that he thought there could not be another roosting-place within thirty miles.

“No attempt has, however, been made, so far as I can trace, to ascertain really the area from whence they came, or the significance of the movement; and if these notes are the means of exciting a wider interest in this most fascinating phenomenon, they will have served a useful purpose.

“The Rook and Jackdaw are too well known to need any introduction in themselves, as one need not go very far from the centre of the city before seeing one or both species. On the principle that ‘familiarity breeds contempt,’ it is perhaps their very abundance which accounts for our incomplete and inaccurate knowledge of them; in fact, as I have frequently learnt to my cost, the information given by country people generally is in most cases absolutely unreliable, and necessitates the personal confirmation of all reports before they can be accepted.

“Of all our local species, the Rook and Jackdaw are the most gregarious. In summer they may be found nesting in colonies—the Rooks at their rookeries, and the Jackdaws in the cliffs or other suitable localities; whilst, after the nesting season, they flock together, roost together, and almost behave as one species. It will save repetition therefore if it is understood that, excepting where specially stated, the following remarks apply equally well to both species.

“Until September sets in the Rooks do not leave their rookeries to roost, and the date of leaving depends not only on the weather, but on the situation of the rookery. If the latter is well sheltered and quiet they are later in leaving than if it is in an exposed situation, but before October is well advanced they have got settled down to their winter habits. Until March comes round again the whole of our Bradford Rooks go to roost at Weston Park, near Otley, to which place they repair every winter afternoon, and come back to their own rookeries each morning, with the striking exception mentioned later. The journeys backward and forward form a most important item in the daily life of the birds. During the shortest days the journey back occupies frequently nearly all the afternoon, varying, of course, with the distance to be travelled, the start usually being made either from their own rookery or the near neighbourhood. At first sight it is a matter of surprise that two, three, and sometimes four hours should be occupied in doing a journey of about ten miles, which in straight flight could be covered by the Rook in about twenty minutes. The mystery is, however, explained when the birds are followed up in the direction in which they go, and shows very strikingly how fond the Rook is of the company of his fellows. The route taken by the bulk of the Bradford birds is over Baildon, Hawksworth, and Menston. Instead of going straight forward, a call is paid on the Baildon Rooks, and large numbers may be seen here idling about, doing very little feeding, but carrying on a vigorous conversation nearly the whole time. As the afternoon progresses another stage of the journey is made to Menston, and the same performance gone through. By this time the numbers are very considerably augmented, and as batch after batch arrives excitement and conversation increase, the birds flying about in flocks, perching in the tree-tops, or standing about in large groups in the fields, gradually working towards Burley.

“Paying a visit to a Rook-roost on a winter's afternoon, one is immediately struck with the entire absence of Rooks, and this becomes more manifest as darkness draws on, and still no birds put in an appearance. Here we come to another striking feature in connection with this matter. Instead of coming into the roosting-trees on arriving at their journey's end, they gather up perhaps a mile away in the fields, or perched on the tops of trees, many flocks having perforce to fly right over the roosting-trees to join their companions, until it is almost too dark to see. They then come over in one huge body, making very little noise until over the actual roosting-trees, and then burst into the most extraordinary noise it is possible to imagine.

"The sight is enough to delight the least enthusiastic of nature lovers. The birds in their thousands come out of the gathering darkness perfectly regularly and without any fuss, almost covering the sky, the noise caused by their wings resembling the rushing of wind through the trees. They circle round and perform all kinds of evolutions over the tree-tops, all the while the Rooks keeping up their cawing, and the Jackdaws their 'jock'-ing, until the effect upon the mind of the observer is truly bewildering. It takes them about fifteen minutes usually to settle down, which they do on to the topmost branches of the trees, but the noise is kept up more or less almost the whole night through. With the first glimmer of dawn they are away again, reaching their rookeries so early as to give people the impression they have never been away from the neighbourhood. The contrast between the morning flight home and the afternoon flight to roost is very marked, but the Rook is a great believer in the early bird catching the worm, and consequently puts off social matters until later in the day.

"In order, however, to obtain a more accurate idea of the reason for this roosting habit, I have followed up the Rooks in other districts within reasonable distance from Bradford, and, with the assistance of various friends, have been able to locate a number of other roosts, which are shown on the map. I think I am justified in stating that the following list represents the whole of the roosts within the limits marked :—

Weston Park.
 Bramham Park.
 Ripley Park.
 Thieves' Gill, near Ripon.
 Eshton Park, Gargrave.

Bretton Park.
 Nostell Park.
 Red House Wood, Moor Monk-
 ton.
 Bishop Wood, near Selby.

"At 'Crow Nest,' Lightcliffe, is a large rookery, well sheltered and quiet, where the local birds occasionally roost in winter. This seems to be quite an exceptional case, and the fact that they are fed by the owner in hard weather will possibly be the explanation of this. At other times, so far as I have been able to ascertain, they roost at Bretton, the Rooks in the Halifax district going to the same place.

The characters of these places may perhaps be more clearly stated in tabular form :—

LOCAL ROOK ROOSTS.

Roost	Character of Plantation.	Shelter afforded	Approx. No. of Birds Roosting there	Proportion of Jackdaws to Rooks	Remarks
Weston Park	Mostly beech and elm, with plantation of spruce, probably 70 or 80 years' growth	On slope of hill in bottom of valley, facing S. Sheltered from N. and E. Good cover provided by spruce, but ordinarily birds roost in both spruce and beech	About 20,000	About one-third	Large rookery
Bramham Park	Beech, elm, &c., probably 100 years old, with undergrowth of yew	Ground level, but birds roost S.W. corner of wood, and consequently are well sheltered from N. and E.	Probably over 20,000	About one-third	Large rookery
Ripley Park	Thick plantation of spruce and larch, probably over 50 years' growth	Plantation not sheltered, but birds all roost in centre trees, and consequently obtain plenty of shelter from surrounding trees	About 20,000	About one-third	Nearest rookery about half-mile away, but unsuitable for roosting
Thieves' Gill, nr. Ripon	Thick plantation of larch, rather less than 70 years' growth	Plantation on west side of narrow dry valley. Birds roost in centre trees	About 20,000	About one-third	Nearest rookery about half-mile away
Easton Park, Gargrave	Beech, ash, &c., intermingled with spruce and larch, very old growth	On slope of hill in bottom of valley, facing W. Sheltered from N. and E.	About 20,000	Nearly half	Large rookery
Bretton Park	Beech, ash, &c., probably 70 or 80 years' growth	On slope of hill facing N. In bottom of valley, and therefore sheltered by opposite side	About 20,000	About one-third	Large rookery at other end of plantation
Nostall Park	Oak wood, with a few chestnuts, &c., about 70 years' growth	Ground level. Trees fairly closely planted, but otherwise no particular claim to shelter	About 20,000	About one-quarter	Several rookeries within short distance, but unsuitable for roosting
Bishop Wood, Selby	Beech, elm, &c., of good age	Ground level, but birds always roost at S. end of wood	About 20,000	About one-third	Nearest rookery some little distance away
Red House Wood	Spruce, larch, oak, &c., thickly planted, old growth	Ground level. Spruce mostly used for roosting, and thus good cover is obtained	About 20,000	About one-third	Large rookery at other end of plantation

"It will be noticed that all these roosts are admirably chosen for shelter from the winter storms, and that they are in parts of the country which are very quiet and secluded, and that the number of birds at each one is approximately the same, although it will be understood that in the nature of things the numbers given can be little more than a rough guess. Many of them also form large rookeries, but whether or how one follows as the result of the other it is difficult to say. Mr. W. Eagle Clarke, of Edinburgh, informs me that practically all the roosts in that district are also large rookeries. With the exception of Bretton, these places have been resorted to for so long as to make it difficult to say when they were first used for roosting purposes. In the case of Bretton, until this winter they roosted in a wood about a mile away from the present one, but have had to give up this on account of it being thinned during the past year. I am also informed that the Thieves' Gill plantation will be cut down during the present year, and it will be interesting to note where these birds next take up their abode.

"I now come to what may perhaps be considered the most curious and interesting phenomenon in connection with the roosting habit. With the exception of Weston, all the other roosts mentioned are used regularly by the Rooks in their own districts from September to March, and once they have all settled down the numbers do not vary until nesting-time comes round again. In my first attempts to track the Bradford Rooks, which covered the period from September to January I was considerably puzzled by the different directions in which they seemed to go, and although during one part of the time they were tracked definitely to the east, later they were equally definitely to the north and north-east, until they were eventually found at Weston. At this place, we were informed by the keeper that for thirty years they had all left here regularly during November and part of December, but that for a year or two previously they had not all gone for this period, and gave as his reason for this that it had been customary to celebrate the 5th of November by a good display of fireworks at the Hall, which had latterly, however, been discontinued, and that this had frightened the birds away for about six weeks every winter. At the time I put this down as simply one amongst many of the stories told about them which usually proved to be incorrect. Since then, however, I have watched them closely during this period of the year, and the result has been to fully confirm, in my opinion, the keeper's explanation. Until about the beginning of November the birds, as usual, go to Weston to roost. About that time they rapidly fall off, and on the 15th November last year only about seven hundred roosted there—in other words,

apparently only those which nested there. At the same time a change in the direction of the Bradford Rooks indicated that all these, without exception, had gone to roost at Bramham. Curious to know what the Bramham roost was like, if all the birds which roost at Weston had gone to the former place, in addition to those which normally roost there, I and two or three friends paid a visit there on the 21st November and witnessed a sight which was really extraordinary. As was surmised beforehand, we found about double the normal number there, and I think I should be quite safe in estimating them at certainly over 80,000. We were favoured with a most beautiful sunset, and the great bulk of the birds had gathered up to the west, towards Harewood. In their characteristic manner they came over to the trees to roost simultaneously in immense battalions, and when performing their final evolutions over the trees it was impossible to look round in any direction without seeing a huge black drifting snowstorm of Rooks and Jackdaws, while the noise they made is better imagined than described. Paying a visit to Weston on December 6th, about twice the number were found to be roosting there than was the case on November 15th, but apparently these were still practically all local birds, there being several large rookeries close together, and no signs were yet to be seen of any tendency of the Bradford Rooks to return there. It was about the 11th of December before the movement back to Weston really began. On this date a flock of Rooks and Jackdaws started off to Bramham as usual, and, after having gone a little way, eight Jackdaws, after much discussion, detached themselves from the flock, and went to Weston, the rest proceeding to Bramham. About twenty were observed to go to Weston on this date. After this the movement quickly gathered force, and, on paying another visit to Weston on December 20th, nearly half the total number were roosting here again, and by the end of the month they were practically all back. What has struck me most forcibly in connection with these observations is the remarkable intelligence displayed by the birds. Instinct, as usually understood, in my opinion, plays no part in the matter, but their capacity for reasoning (limited, of course) is evident even to a casual observer.

“ This was well illustrated in the case of the Jackdaws just mentioned. On another occasion a flock of about a hundred were feeding in a field, when a tremendous uproar occurred amongst them, every bird appearing to be talking to each other, after which half of them left for Bramham, the remaining half staying behind. After about a quarter of an hour these without hesitation flew off to Weston. The only inference that could be drawn was that they had settled before the first

batch left where they intended going, and went accordingly. The whole movement, in fact, seems to indicate very plainly that as they had been frightened so frequently in early November, they no longer consider it safe to roost there during that period, and only gradually pluck up sufficient courage to return. The fireworks have now been discontinued for a year or two, but the habit of leaving at this time has apparently got ingrained, although I think there are indications that they are breaking off the habit, as witness the Weston Rooks, which have stayed the year round since the fireworks were stopped.

"According to Colonel Dawson, the courteous owner of Weston, the habit started about thirty years ago, coincident with the fireworks, as before then they did not leave, and, if nothing occurs in the meantime, a few more years will probably see them again staying there throughout the winter. In the meantime, it offers a most interesting study in avian intelligence, and incidentally shows how the Rooks stick to their old roosting-trees, or they would otherwise have long since forsaken this place altogether.

"The whole phenomenon of winter roosting by these birds may, I think, be explained by two reasons, *i. e.* shelter and safety. Evidently they consider there is safety in numbers, and as has been already seen, there are no roosts in parts of the country where the birds are likely to be disturbed, even though there may be other places in the neighbourhood which may afford as efficient shelter."

IN the 'Irish Naturalist' for this month Sir Robert Lloyd Patterson continues his notes on "The Common Mussel in Belfast Lough":—

"The quantity of Mussels (*Mytilus edulis*) exported from Belfast in the first three months (January, February, and March) of the following years was:—1889, 488 tons; 1890, 256 tons; 1891, 233 tons; 1892, 5 tons; 1893, 1 ton; 1894, 1532 tons; similar returns for subsequent years up to the present being as follow (I am indebted for them to Mr. W. A. Currie, the courteous Secretary of the Belfast Harbour Commissioners):—

	First three months	Whole year
1895	705 tons	3194 tons
1896	1076 "	3518 "
1897	240 "	1229 "
1898	2237 "	3974 "
1899	1547 "	2610 "
1900	694 "	1287 "
1901	724 "	1436 "
1902	660 "	1214 "
1903	274 "	566 "
1904	65 "	

"It will be observed that shortly after the almost blank years 1892 and 1893, and again after a comparatively small year, such as 1897, a considerable, in the latter case a very large, increase is shown; while, on the other hand, a considerable diminution generally followed the big years, such as 1894 and 1896, 1899 being no exception, although the quantity is so large, as in that year newly-found beds continued productive till over-fishing had its usual result. The recuperative power of the Mussel is evidently very great, a couple or three years apparently sufficing to restock almost exhausted beds. In certain circumstances raking and dredging cause a great destruction of the bivalves besides those that are taken. A few years ago, when these methods of capture were in active operation on some beds off Marino and Cultra, a severe north-westerly gale came on, with the result that an enormous quantity of Mussels, which had been forcibly detached from their natural 'moorings' on the floor of the sea, were driven ashore at Cultra Point, where, at high-water mark, they formed a ridge about sixty yards long, two yards broad at the base, and between two and three feet high.

"In October, 1898, the Inspectors of Irish Fisheries held an inquiry here, with the result that a close-time for Mussels (from May 15th to September 30th, both days included) was promulgated. This I considered very desirable, but the Mussel-fishers objected; and, after some time, the restriction was either modified or entirely removed—I forget which—the result being apparent in the diminished returns of the last couple of years. This year I saw several of the Mussel-boats lying in Conn's Water, laid up unused.

"The Mussels fetched 10s. per ton at the ship's side, and, besides those exported, some were used for bait by the Ardglass and other fishermen, and some are locally used as food; so it will be seen that the industry was one of some importance to those engaged in it, and its recurrent decline, due, in my opinion, to over-fishing, is much to be regretted."

A COMPLAINT was made recently by some American fishermen from Newport that their business was being injured by the battleship 'Illinois,' which was engaged in target practice. The fishermen asserted that the detonation from the heavy guns had the same effect upon the fish as a thunderstorm. They declared that the fish leave the surface, and remain at the bottom while the firing is in progress. These conditions prevail within the radius of from eight to ten miles of the vessel, and as a consequence the fishermen said they had been obliged to abandon their work. They said that they had decided to lay their grievances before the Secretary of the Navy.—*Sun, June 25th.*

LAST year many plants produced few good seeds, and some none at all. The farmers around, also, complained of the infertility of the eggs of their ducks and fowls. The same conditions seem to have prevailed among wild birds. I found a most unusual number of nests containing addled eggs, some of them belonging even to birds which had wintered abroad, such as Swallows. This year there has been a great difference. I can speak only of wild birds, but such as have come under my own observation have all hatched their broods—of course, some, like the Flycatchers, are only now laying—and in most cases they did so remarkably early. I noticed a nest of young Thrushes almost ready to leave the nest on April 12th, and a day or two later they had flown, much before the usual time. Last year the Swallows did not arrive until May 1st, which was late, whereas this year they arrived on April 18th, which was early.—“Leaves from a Gardener's Note-Book,” June 7th (*Garden Life*).

At a meeting of the Linnean Society of New South Wales, held on March 30th last, Mr. North exhibited skins, nests, and eggs of *Acanthiza ewingi*, Gould, and *Acanthornis magna*, Gould, from Tasmania. They were received by the Trustees of the Australian Museum in March, 1902, the birds being sent in the flesh. The nest of *Acanthiza ewingi* is a neat dome-shaped structure, with a rounded entrance in the side. Externally it is formed of thin strips of bark and bark-fibre, and thickly coated with bright green moss, the inside being lined with the rich brown downy covering of freshly budded fern-fronds, and a thick layer of feathers of the Yellow-bellied Parrakeet. It measures externally $4\frac{1}{2}$ in. in height, 3 in. in diameter, and across the entrance $1\frac{1}{2}$ in. The eggs, three in number, are rounded-ovals in form, pure white, with distinct zones on the larger ends formed of small confluent spots, flecks and streaks of different shades of purplish red. Length (A) 0.68×0.52 in.; (B) 0.67×0.52 in.; (C) 0.69×0.5 in. Two eggs in the collection of Mr. Charles French, Jun., taken prior to 1899 by Mr. G. F. Hinsby on Mount Wellington, near Hobart, measure alike 0.67×0.49 in.

On the subject of Beri-beri disease, which is now engaging considerable attention, Sir George Birdwood writes in the ‘Times’ (June 25th) as follows:—

“The first medical writer to describe Beri-beri, and by that name, was Dr. J. D. Malcolmson, F.R.S., of the Madras Medical Service, in

a paper published in 1885. Sir Joseph Fayrer, F.R.S., wrote on it, identifying one form of it with the *barbiers* of the earlier European travellers, in the 'Practitioner' for January, 1877. There is much about it in the 'Report on Prison Administration in Burma for 1878.' Dr. Lodewijks published a pamphlet on it in 1882, and in the 'St. James's Gazette' of August 9th, 1885, there is a notice of Dr. Wallace Tayler's discoveries in connection with the disease in Japan, where, according to Miss Bird, it is known by the name of *kakke*.

"The disease is endemic in Western India, in the Indian Archipelago, and throughout the coasts of Further India and Upper India, or China and Japan. It is practically confined to the labouring classes where they are vegetarians. Dr. Wallace Taylor traces it to a microscopic spore infecting rice, but the salient fact is that it almost exclusively attacks those who are engaged in hard labour on insufficient nourishment, and it may be defined as the scurvy of the tropics. It is marked by extreme weakness and frightful dropsical distension of the belly, limbs, and face, both symptoms developing so rapidly as to terrify alike the sufferer and those attending to him. Hence the name *beri*, meaning 'debility,' and the reduplication of it, '*beri-beri*,' signifying 'extreme,' 'alarming,' 'fatal' debility. I had emphatic experience of the disease, and I never knew it to attack a woman; and, so far as my experience went, there was no treatment for it but feeding up the men labouring in circumstances conducive to its attacks with animal food and alcoholic stimulants.

"For further non-contentious particulars I would respectfully refer your readers to Sir Henry Yule's '*Hobson Jobson*' (the 2nd edition by Mr. William Crooke was recently published by Murray), under the article '*Beri-beri*,' to which I myself was a contributor; also to the '*Encyclopædia Britannica*,' xxxi. 541 b., and xxvi. 222."

At the feather sale at the Commercial Sale Rooms, London, in April, there were 161 packages of Osprey feathers, being all the plumes of the various Egrets and small Eastern Herons, with a few of the Common Heron. Of Birds of Paradise, from New Guinea, there were 8255; of Impeyan Pheasants, from the Himalayas, 648; of Indian Rollers (Jays), no fewer than 8918, with also a large number of East India Pigeons' wings, and Pittas, Indian Owls, Parrots, and Jungle-Cocks. One firm offered for sale 469 Chinese Mandarin Ducks. The remainder of the birds were mostly from America, comprising 52,628 Humming-Birds, and numerous Cardinals, Tanagers, Trogons, Toucans, Parrots, &c. There were also a large quantity of wing-quills from Pelicans, Swans, Geese, Turkeys, and Eagles.

At the June sale the "Osprey" feathers numbered 165 packages. There were 1835 Birds of Paradise, 10 cases of Peacock-feathers (about 100 lb. to the case), 18 packages of quills, and 87 cases of various bird-skins, which last included many Humming-Birds, Tanagers, Impeyan and Argus Pheasants; Owls (one firm offered 8674), Bronze Ibis (skins and wings), Mandarin Ducks, &c. Japanese Teal are seldom seen at these sales, but one firm offered for sale 7200 pairs of wings.—*The Shooting Times and British Sportsman*.

It is practically certain, Mr. R. Lydekker declares in 'Knowledge & Illustrated Scientific News' for July, that from the time Salmon leave the sea until the close of the spawning operations they take, as a rule, no food of any kind. It may be taken as an established fact that the true feeding-ground of the Salmon is the ocean, and that while in fresh water these fish preserve a more or less strict and complete fast. Much the same is true of the Pacific species of Salmon, which belong to a distinct genus (*Oncorhynchus*), and afford a large proportion of our supply of tinned Salmon. After leaving tidal waters the throat of these fishes becomes contracted, and their stomachs are almost always found to be empty. "The tendency to feed," write Messrs. Townsend and Smith, "becomes less the longer they remain, and when one has seen the enormous runs of Salmon that sometimes actually crowd the streams, so that it would be impossible to wade without stepping upon them, it becomes apparent that they could not make their rapid journeys to the head-waters of the largest rivers and have time to feed, and that there could not be food enough to supply them if they required it. If such hordes should become hungry while on the spawning-grounds hundreds of miles from the sea, one could imagine the effect on the spawning operations. As a matter of fact, the Salmon, after leaving tide-water, lives on its own supply of fat and blood. Its flesh becomes less and less red, and the fish becomes thinner as it advances up stream. . . . The degree of emaciation reached, and the extent of the injuries received by the Salmon by the time it has spawned, preclude the possibility of its recovering, even if it reaches salt water alive. Death is a natural result of the conditions." In thus starving and spawning themselves to death, Pacific Salmon (of which there are several kinds) differ markedly from our own *Salmo salar*—by far the finer and nobler fish—which may return to its spawning-grounds for several years in succession.

THE ZOOLOGIST

No. 758.—August, 1904.

ON THE MEASUREMENTS AND WEIGHTS OF THE EGGS OF THE COMMONER CHARADRIIDÆ.

BY K. & R. M. BUCHANAN.

It would be difficult to find a subject of such general interest to ornithologists—and especially to oologists—that has been more neglected than the weights of birds' eggs. The reason for this is not easy to find, for it is hard to believe that the trouble involved can have deterred a body of men who, whatever their faults may be, spare neither time nor labour in the prosecution of their favourite study. A more probable explanation is that the importance of the subject was, until recently,* never fully realized; and that ornithologists, in the past, found ample scope for the exercise of their talents in gleaning the vast amount of exact information now accumulated. At the present time, when the number of workers is continually being augmented and specialization is the order of the day, it is but natural that many subjects, previously overlooked, should be taken up and thoroughly investigated.

Considerable importance has always been attached to the size of birds' eggs, and one has only to consult any of the standard works on ornithology to learn how carefully their measurements have been ascertained. But a knowledge of the length and breadth of an egg enables one to form only an inadequate conception of its size. This is specially noticeable in the case of the order under consideration, for the eggs of the *Limicolæ* may

* 'Zoologist,' 1901, pp. 110, 111; 'Irish Naturalist,' November, 1901, and October, 1902.

be either obtusely or acutely pyriform. An egg of *Hæmatopus ostralegus*, e. g., owing to its shape, has a greater displacement than one of *Charadrius pluvialis* of the same length and breadth. Another conspicuous drawback to the method of estimating the size of eggs by their measurements alone is at once apparent when those of several species have to be compared. It is almost impossible to form a just appreciation where two factors, both very variable, are all the data in one's possession. Now, it is when several sorts of eggs have to be contrasted that the real value of a knowledge of their weights is revealed. Apart from the advantage of having only one set of figures to consider, in absolutely fresh specimens, under normal conditions, disparity in weight indicates a superiority or inferiority in size, and the difference in weight represents the true difference in mass.

Much more might be adduced in favour of the hypothesis, that a knowledge of the weights of eggs is more useful than a knowledge of their measurements; but no useful purpose would be served by prolonging this argument. We cannot, however, leave the subject without illustrating the benefit accruing from a judicious consideration of measurements and weights when taken in conjunction. An oologist, with a precise knowledge of the measurements and weights of the eggs of the *Limicolæ*, reading a description of those of the *Gaviæ*, could readily deduce the more obtuse pyriformity of the latter, if their lengths, breadths, and weights were given.

In compiling the following statistics we have not included particulars of abnormal eggs, for, however interesting they may be to the specialist, they supply no material help to the intelligent study of ornithology. At the same time, mistakes arising from purely natural causes are so easily overlooked, that we must make special mention of a few of them. The subtle changes incident to the development of the embryo exert a profound influence on the weight of an egg; and, as nearly all "errors of observation" arise from this cause, we have made it a rule to reject any eggs in which incubation has advanced beyond the stage of the "primitive streak." Another source of error is the keeping of eggs for some time before weighing them, for as soon as an egg is laid it begins to lose weight owing to evaporation. In small eggs this loss, it is true, is infinitesimal; but in large

porous-shelled eggs, which have been kept for a few days in a warm room, it is a serious item. When clutches are large, *e. g.* in the case of *Gallinæ* or *Fulicariæ*, if the weather be warm, the first egg laid must necessarily lose a considerable amount of weight before the full complement is reached. Inaccuracies arising from this cause are unavoidable.

With these introductory remarks we shall now consider the measurements and weights of birds' eggs in intension.

COMMONER CHARADRIIDÆ.

Clutches marked "absolutely fresh" were weighed only a few hours after the last egg was laid. Those marked "fresh" were complete when found, but on careful examination showed no sign of incubation. For practical purposes these terms may be regarded as synonymous.

ÆGIALITIS HIATICOLA. Ringed Plover.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
A. <i>A. hiaticola</i>	1·842	1·006	10·742
Number of eggs in clutch—four	1·841	1·048	11·044
Condition—absolutely fresh.....	1·862	1·087	11·572
Taken on May 17th, 1902.....	1·418	1·086	11·790
Weight of clutch .....	.....	.....	45·148
B. <i>A. hiaticola</i>	1·861	1·012	11·262
Number of eggs in clutch—four	1·884	1·081	11·780
Condition—absolutely fresh.....	1·422	1·082	11·952
Taken on May 5th, 1904	1·463	1·027	12·177
Weight of clutch .....	.....	.....	47·121
C. <i>A. hiaticola</i>	1·426	1·005	11·770
Number of eggs in clutch—four	1·419	1·021	11·940
Condition—fresh	1·482	1·008	12·285
Taken on May 5th, 1902	1·394	1·088	12·299
Weight of clutch .....	.....	.....	48·294
D. <i>A. hiaticola</i>	1·850	1·058	12·182
Number of eggs in clutch—four	1·405	1·050	12·352
Condition—absolutely fresh	1·478	1·049	12·953
Taken on May 5th, 1904	1·488	1·067	12·968
Weight of clutch .....	.....	.....	50·450

CHARADRIUS PLUVIALIS. Golden Plover.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
A. <i>C. pluvialis</i>	2.070	1.878	81.857
Number of eggs in clutch—four	2.046	1.888	82.118
Condition—absolutely fresh	2.049	1.400	82.882
Taken on April 27th, 1901	2.185	1.891	88.865
Weight of clutch .....	.....	.....	180.167
B. <i>C. pluvialis</i>	2.062	1.868	82.169
Number of eggs in clutch—four	2.084	1.412	83.289
Condition—absolutely fresh	1.969	1.416	83.402
Taken on May 8th, 1902	2.029	1.424	84.860
Weight of clutch .....	.....	.....	188.170
C. <i>C. pluvialis</i>	2.088	1.409	84.198
Number of eggs in clutch—four	2.040	1.467	86.168
Condition—absolutely fresh	2.114	1.462	86.982
Taken on April 27th, 1904	2.152	1.468	88.072
Weight of clutch .....	.....	.....	145.865
D. <i>C. pluvialis</i>	1.998	1.447	85.886
Number of eggs in clutch—four	2.388	1.898	87.648
Condition—absolutely fresh	2.149	1.472	88.028
Taken on April 30th, 1904	2.887	1.454	89.792
Weight of clutch .....	.....	.....	151.299

VANELLUS VULGARIS. Lapwing.

A. <i>V. vulgaris</i>	1.797	1.826	25.907
Number of eggs in clutch—four	1.776	1.851	26.835
Condition—absolutely fresh	1.772	1.844	26.857
Taken on April 8rd, 1904.....	1.744	1.866	27.022
Weight of clutch .....	.....	.....	106.621
B. <i>V. vulgaris</i>	1.928	1.814	27.087
Number of eggs in clutch—four	1.917	1.880	27.667
Condition—absolutely fresh	1.958	1.818	27.958
Taken on April 5th, 1904.....	2.011	1.887	29.162
Weight of clutch .....	.....	.....	111.824

VANELLUS VULGARIS—continued.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
C. <i>V. vulgaris</i>	1·869	1·849	27·857
Number of eggs in clutch—four	1·920	1·841	28·112
Condition—absolutely fresh	1·931	1·871	29·242
Taken on April 3rd, 1904.....	1·961	1·868	29·577
Weight of clutch.....	.....	.....	114·788
D. <i>V. vulgaris</i>	1·939	1·853	28·720
Number of eggs in clutch—four	1·979	1·850	29·415
Condition—absolutely fresh	1·931	1·875	29·504
Taken on April 10th, 1903	2·020	1·968	29·795
Weight of clutch .....	.....	.....	117·484

Note.—For additional particulars, see 'Field,' Dec. 19th, 1903. No. 2660.

HÆMATOPUS OSTRALEGUS. Oystercatcher.

A. <i>H. ostralegus</i>	—	—	—
Number of eggs in clutch—three	2·204	1·528	42·881
Condition—fresh	2·250	1·532	44·519
Taken on May 5th, 1902	2·265	1·541	45·460
Weight of clutch .....	.....	.....	182·860
B. <i>H. ostralegus</i>	—	—	—
Number of eggs in clutch—three	2·281	1·508	43·848
Condition—absolutely fresh	2·234	1·528	44·161
Taken on May 10th, 1902.....	2·255	1·570	47·848
Weight of clutch.....	.....	.....	185·857
C. <i>H. ostralegus</i>	—	—	—
Number of eggs in clutch—three	2·294	1·555	47·267
Condition—fresh	2·240	1·579	47·654
Taken on May 9th, 1903	2·145	1·640	49·872
Weight of clutch.....	.....	.....	144·293
D. <i>H. ostralegus</i>	—	—	—
Number of eggs in clutch—three	2·281	1·602	50·164
Condition—absolutely fresh	2·310	1·595	50·807
Taken on May 7th, 1904	2·160	1·648	50·666
Weight of clutch .....	.....	.....	151·187

HÆMATOPUS OSTRALEGUS—continued.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
E. <i>H. ostralegus</i>	2·860	1·587	46·867
Number of eggs in clutch—four	2·840	1·589	48·304
Condition—absolutely fresh	2·832	1·599	50·272
Taken on May 5th, 1904	2·417	1·587	50·857
Weight of clutch.....	.....	.....	196·300
F. <i>H. ostralegus</i>	2·802	1·554	48·559
Number of eggs in clutch—four	2·274	1·568	48·610
Condition—fresh	2·258	1·598	49·389
Taken on May 5th, 1902	2·291	1·591	49·952
Weight of clutch .....	.....	.....	196·510

SCOLOPAX RUSTICULA. Woodcock.

A. <i>S. rusticula</i>	1·685	1·256	22·725
Number of eggs in clutch—four	1·688	1·274	23·444
Condition—fresh	1·711	1·279	28·751
Taken on March 22nd, 1902 ...	1·670	1·290	28·905
Weight of clutch .....	.....	.....	98·825
B. <i>S. rusticula</i>	1·712	1·275	23·629
Number of eggs in clutch—four	1·742	1·296	24·787
Condition—absolutely fresh	1·772	1·294	25·025
Taken on May 8th, 1902	1·748	1·802	25·462
Weight of clutch .....	.....	.....	98·903

GALLINAGO CÆLESTIS. Common Snipe.

A. <i>G. cælestis</i>	1·521	1·082	14·705
Number of eggs in clutch—four	1·477	1·087	14·865
Condition—absolutely fresh	1·507	1·104	15·608
Taken on June 9th, 1904.	1·546	1·098	15·627
Weight of clutch .....	.....	.....	60·800
B. <i>G. cælestis</i>	1·552	1·106	15·441
Number of eggs in clutch—four	1·591	1·104	15·646
Condition—absolutely fresh	1·632	1·087	15·820
Taken on May 4th, 1901	1·563	1·118	16·056
Weight of clutch .....	.....	.....	62·968

GALLINAGO CÆLESTIS—continued.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
C. <i>G. caelestis</i>	1·586	1·119	16·128
Number of eggs in clutch—four	1·627	1·121	16·818
Condition—absolutely fresh	1·685	1·118	16·467
Taken on May 1st, 1901	1·597	1·148	16·845
Weight of clutch .....	.....	.....	65·758
D. <i>G. caelestis</i>	1·548	1·128	16·212
Number of eggs in clutch—four	1·547	1·124	16·292
Condition—absolutely fresh	1·570	1·125	16·878
Taken on May 1st, 1901	1·558	1·149	17·184
Weight of clutch .....	.....	.....	66·011
E. <i>G. caelestis</i>	1·684	1·122	16·868
Number of eggs in clutch—four	1·598	1·187	16·888
Condition—fresh	1·685	1·105	17·142
Taken on June 5th, 1904	1·671	1·127	17·425
Weight of clutch .....	.....	.....	68·818

Note.—The fact that clutches A. and E. were taken in June inclines us to the belief that they are second or even third layings; if this be true, the disparity in their weights is particularly interesting.

TRINGA ALPINA. Dunlin.

A. <i>T. alpina</i>	1·810	0·926	8·808
Number of eggs in clutch—four	1·851	0·909	8·878
Condition—absolutely fresh	1·808	0·982	9·105
Taken on May 24th, 1902.....	1·821	0·981	9·188
Weight of clutch .....	.....	.....	85·974
B. <i>T. alpina</i>	1·875	0·946	9·864
Number of eggs in clutch—four	1·824	0·970	10·080
Condition—fresh	1·845	0·979	10·895
Taken on May 24th, 1908	1·860	0·978	10·457
Weight of Clutch .....	.....	.....	40·796
C. <i>T. alpina</i>	1·928	0·969	10·270
Number of eggs in clutch—four	1·867	0·988	10·700
Condition—absolutely fresh	1·867	0·986	10·875
Taken on May 15th, 1904.....	1·418	0·979	10·950
Weight of clutch.....	.....	.....	42·795

TRINGA ALPINA—continued.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
D. <i>T. alpina</i>	1.409	0.984	10.824
Number of eggs in clutch—four	1.888	0.996	11.081
Condition—absolutely fresh	1.417	0.990	11.886
Taken on May 21st, 1908	1.435	0.991	11.474
Weight of clutch.....	.....	.....	44.765
E. <i>T. alpina</i>	1.504	0.998	11.887
Number of eggs in clutch—four	1.509	1.001	11.962
Condition—fresh	1.472	1.008	12.018
Taken on May 21st, 1908.....	1.481	1.086	12.575
Weight of clutch.....	.....	.....	48.442

TOTANUS HYPOLEUCUS. Common Sandpiper.

A. <i>T. hypoleucus</i>	1.410	1.054	12.695
Number of eggs in clutch—four	1.409	1.061	12.752
Condition—absolutely fresh	1.470	1.082	12.912
Taken on May 20th, 1904.....	1.460	1.055	13.070
Weight of clutch.....	.....	.....	51.429
B. <i>T. hypoleucus</i>	1.406	1.055	12.542
Number of eggs in clutch—four	1.455	1.057	12.857
Condition—fresh	1.382	1.080	12.877
Taken on June 7th, 1902	1.444	1.092	18.765
Weight of clutch.....	.....	.....	52.041
C. <i>T. hypoleucus</i>	1.441	1.056	18.110
Number of eggs in clutch—four	1.440	1.066	18.179
Condition—absolutely fresh.....	1.525	1.031	18.264
Taken on May 20th, 1908.....	1.468	1.072	18.859
Weight of clutch.....	.....	.....	58.412
D. <i>T. hypoleucus</i>	1.486	1.077	18.745
Number of eggs in clutch—four	1.517	1.068	14.175
Condition—absolutely fresh	1.499	1.080	14.484
Taken on May 20th, 1904.....	1.471	1.116	14.985
Weight of clutch .....	.....	.....	57.339

TOTANUS CALIDRIS. Redshank.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
A. <i>T. calidris</i>	1·749	1·174	19·425
Number of eggs in clutch—four	1·835	1·192	20·757
Condition—absolutely fresh	1·856	1·187	20·905
Taken on May 2nd, 1902	1·802	1·205	21·077
Weight of clutch.....	.....	.....	82·164
B. <i>T. calidris</i> ..	1·775	1·239	21·842
Number of eggs in clutch—four	1·778	1·244	21·755
Condition—fresh	1·807	1·240	21·759
Taken on April 26th, 1902	1·911	1·222	22·004
Weight of clutch.....	.....	.....	86·860
C. <i>T. calidris</i>	1·780	1·248	22·198
Number of eggs in clutch—four	1·750	1·275	22·718
Condition—fresh	1·785	1·267	23·076
Taken on April 26th, 1902	1·862	1·268	23·771
Weight of clutch.....	.....	.....	91·763
D. <i>T. calidris</i>	1·851	1·242	22·458
Number of eggs in clutch—four	1·816	1·268	23·156
Condition—absolutely fresh	1·789	1·280	23·291
Taken on April 29th, 1901	1·888	1·285	23·782
Weight of clutch .....	.....	.....	92·687

NUMENIUS ARQUATA. Common Curlew.

A. <i>N. arquata</i>	2·712	1·855	75·909
Number of eggs in clutch—four	2·666	1·869	77·284
Condition—absolutely fresh	2·708	1·862	77·385
Taken on April 28rd, 1904	2·791	1·909	83·475
Weight of clutch.....	.....	.....	314·053
B. <i>N. arquata</i>	2·732	1·914	78·719
Number of eggs in clutch—four	2·669	1·938	79·857
Condition—fresh	2·812	1·889	80·209
Taken on May 8rd, 1902	2·794	1·901	81·329
Weight of clutch.....	.....	.....	320·114

NUMENIUS ARQUATA—continued.

Particulars of Clutches	Length, inches	Breadth, inches	Weight, grammes
C. <i>N. arquata</i>	2·672	1·887	79·815
Number of eggs in clutch—four	2·702	1·882	81·112
Condition—absolutely fresh	2·749	1·909	85·057
Taken on April 24th, 1902	2·804	1·914	86·055
Weight of clutch.....	.....	.....	882·089
D. <i>N. arquata</i>—.....	2·665	1·964	85·609
Number of eggs in clutch—four	2·595	1·978	85·664
Condition—absolutely fresh	2·799	1·987	86·867
Taken on May 2nd, 1902	2·952	1·986	90·476
Weight of clutch.....	.....	.....	848·116

In preparing the above tables we had considerable difficulty in deciding what to include and what to leave out. Our original intention was merely to give particulars of the heaviest and lightest clutches examined of each species; but, on further consideration, we judged it expedient to enter more fully into the *minutiæ* of the subject. In coming to this decision we were influenced by a desire to illustrate the gradation of variation.

While preserving the integrity of the clutches, we have arranged the eggs in ascending order. This should facilitate comparisons.

The classification and nomenclature is after that of Mr. Howard Saunders's well-known 'Manual.'

We take this opportunity of thanking friends and correspondents who, either by supplying materials for our researches, or by granting us permission to roam at will through their covers and across their moors, have ably seconded our efforts.

MIGRATION OF BIRDS IN NORTH-EAST LINCOLN-SHIRE IN THE AUTUMN OF 1903.

BY G. H. CATON HAIGH.

THE autumn of 1903 was characterized by extremely cold and wet weather, with a prevalence of strong winds, chiefly from points between N.E. and S.W. Large tracts of country were repeatedly flooded in the marsh district, especially during August and September. Indeed, all the meteorological conditions were as unfavourable to the passage of migrants as can possibly be imagined. Consequently there was very little visible migration, and the bulk of the birds passed in two great rushes. The first commenced on Sept. 19th, lasting until the 26th, and was the most remarkable movement that has occurred during recent years, not only on account of the abundance of birds, but also of the large number of species represented. Among these the most conspicuous, and by far the most abundant, was the Redstart, but the Pied Flycatcher, Willow-Wren, and Goldcrest were very numerous. The weather conditions prevailing at the time were such as might be expected to produce a great movement. A long spell of unfavourable conditions coming to an end on Sept. 18th, and giving place to a period of fine weather, with light E. and S.E. winds.

The only similar migratory movement during recent years occurred at the same period of 1892, and comprised many of the same species. They were not, however, so abundantly represented, and the rush was of shorter duration.

The second movement, in mid-October, was in no way remarkable, and calls for no particular mention. Among the most interesting occurrences of the season was the appearance of the Bluethroat in September, and the great flight of Rough-legged Buzzards in October. The scarcity of the Snow-Bunting and Brambling was also remarkable.

Shore-birds of all sorts were more numerous than for several

seasons past, but were quickly driven away from the Humber "flats" by the fusilade opened upon them by the Cleethorpes "trippers" during the first week of September.

The County Council have taken a most unfortunate and ill-advised step in the alteration of the close-time from Aug. 31st to Aug. 15th, a change which will allow of the destruction of many immature Ducks, particularly Sheld-ducks, a species which had increased considerably since the passing of the Wild Birds Protection Act.

In conclusion, I must thank Mr. H. H. Kew, of Louth, and Mr. F. Jeffreys, of Grimsby, for calling my attention to any rare birds brought to their shops for preservation.

Turdus viscivorus (Mistle-Thrush).—This bird was very abundant all through the autumn, large flocks assembling in the fields inland as early as July. I saw a large flock on the coast on Oct. 2nd, which was probably immigrant.

T. musicus (Song-Thrush).—The passage of this species commenced early, and I noticed several on the coast on Aug. 27th, and Sept. 1st and 2nd. A few took part in the great rush of small birds on Sept. 21st, but the principal passage took place in October, and Thrushes swarmed on the coast from the 3rd until the 23rd of that month.

T. iliacus (Redwing).—I saw a single Redwing near the coast at North Cotes on Sept. 18th, but the main immigration took place on Oct. 9th and 13th, particularly on the latter day.

T. pilaris (Fieldfare).—A flock of thirteen Fieldfares passed to S.W. over Grainsby on Oct. 18th, flying at a great height. Very large flocks arrived on Nov. 1st.

T. merula (Blackbird).—A few Blackbirds took part in the great bird-rush of mid-September. The most important movement, however, took place between Oct. 13th and 23rd. Throughout this period old and young birds of both sexes travelled together.

T. torquatus (Ring-Ouzel).—Dozens of Ring-Ouzels appeared on Sept. 21st with the great rush of small birds on that date. They only remained a short time, as I only saw some half-dozen on 22nd and 23rd, and none after 24th. Two or three appeared again on Oct. 13th, with Blackbirds, Thrushes, and Redwings.

Saxicola oenanthe (Wheatear).—First appeared on Aug. 17th, and was very abundant during the great bird movement from Sept. 19th to 23rd. Was last seen on Oct. 2nd.

Pratincola rubetra (Whinchat).—A few on hedges near the sea on Aug. 27th, and many among the great flight of small birds on Sept. 22nd.

P. rubicola (Stonechat).—Two or three on the sea-bank on Aug. 14th, and one on a hedge near the sea on Oct. 2nd.

Ruticilla phoenicurus (Redstart).—A few Redstarts appeared on the coast on Sept. 9th, 10th, and 16th; while on the 19th there arrived the greatest flight of the species that has taken place for the last eleven years, namely, since September, 1892, when a somewhat similar movement occurred. From Sept. 19th to 23rd Redstarts swarmed in every available covert near the coast, even frequenting turnip and clover fields. From the 23rd their numbers decreased rapidly, and few remained until the end of the month. Last seen on Oct. 2nd.

Cyanecula suecica (Arctic Bluethroat).—On Sept. 21st I shot a couple of Bluethroats on hedges near the coast, and at least one other was seen. Those shot were an adult male and female. On the same day my keeper, who was with me, saw a bird which he described as a Redstart, but with a bluish-grey back and bright blue tail. It perched for a moment on the hedge which he was beating only a few yards before him, and then flew away inland, and could not be found again, although much time was spent in the search. I only saw it in flight at sixty or seventy yards distance, when it seemed blue on both wings and tail. It was probably an example of *Nemura cyanura*, but, not having obtained it, identity must remain a mystery.

Erithacus rubecula (Robin).—Robins were extensively represented in the great flight of birds on Sept. 19th, and continued in great abundance until Sept. 26th.

Sylvia cinerea (Whitethroat).—Unusually scarce all the autumn, though small numbers were present in the vicinity of the coast from Sept. 2nd to 26th, and a single bird on Oct. 9th.

S. curruca (Lesser Whitethroat).—First appeared on coast on Aug. 11th, and a few were present at intervals up to Oct. 7th.

S. atricapilla (Blackcap).—I shot a female Blackcap in a hedge near the sea-bank at North Cotes on Sept. 21st.

S. hortensis (Garden-Warbler).—One or two of these Warblers appeared on the coast on Sept. 19th, and again on 22nd.

Regulus cristatus (Goldcrest).—The first Goldcrest appeared on the coast on the unusually early date of Sept. 7th; from this time to the 13th a few were generally to be seen, but during the great "rush" of small birds between 19th and 26th the species was abundant on all trees and hedges in the coast district. They then became scarce till Oct. 7th, when a second but much smaller migration set in, lasting till the 21st. I saw Goldcrests on the coast for the last time on 26th.

Phylloscopus rufus (Chiffchaff).—Chiffchaffs appeared singly at intervals between Sept. 9th and Oct. 9th. One which I shot on Sept. 10th was a very small and dull-coloured bird.

P. trochilus (Willow-Wren).—An extremely heavy migration of this species took place, commencing as early as Aug. 11th, and continuing with little intermission till Oct. 7th. It was, however, during the great "rush" of Sept. 19th to 25th that the passage of these little birds reached its height, and from the 21st to 24th they were more numerous along the coast than I have ever known them before.

Acrocephalus streperus (Reed-Warbler).—Always a scarce migrant. I shot single individuals on hedges near the coast on Sept. 18th and 19th.

Locustella naevia (Grasshopper-Warbler).—I shot an example of this species in a hedge near the Marshchapel sea-bank on Sept. 23rd.

Accentor modularis (Hedge-Sparrow).—A few came on with the other small birds on Sept. 19th.

Parus major (Great Titmouse).—Only one seen at North Cotes on Sept. 9th.

P. caeruleus (Blue Titmouse).—Very scarce; a few appeared on Sept. 9th and 10th.

P. palustris (Marsh Titmouse).—I saw a small flock at Keelby on Feb. 22nd, 1904.

Troglodytes parvulus (Wren).—First appeared on the coast on Sept. 23rd, a good many arriving on 30th, and a still larger number on Oct. 23rd.

Motacilla lugubris (Pied Wagtail).—Very scarce throughout the autumn. Several on the sides of North Cotes sluice on Oct. 9th.

M. melanope (Grey Wagtail).—First appeared at North Cotes on Sept. 23rd.

M. raii (Yellow Wagtail).—A few young birds on Aug. 14th. Several, both old and young, on Sept. 2nd, and three seen at Fenby on the very late date of Oct. 5th.

Anthus trivialis (Tree-Pipit).—First appeared on Sept. 7th, and was fairly numerous from Sept. 19th till Oct. 2nd.

A. pratensis (Meadow-Pipit).—Very abundant from Sept. 9th to 22nd.

A. obscurus (Rock-Pipit).—Many Rock-Pipits arrived all along the coast on Sept. 19th.

Lanius collurio (Red-backed Shrike). — Two Red-backed Shrikes, which I saw at the shop of Mr. H. H. Kew, of Louth; were said to have been killed near Alford in the summer.

Muscicapa atricapilla (Pied Flycatcher).—A few Pied Flycatchers were usually present on the coast hedges from Aug. 24th to Sept. 18th. On 19th scores of these little birds appeared, and remained abundant till the 23rd, a few staying till the 26th.

M. grisola (Spotted Flycatcher).—Always a scarce migrant. A few appeared on Sept. 19th, and again on 23rd.

Hirundo rustica (Swallow).—I noticed many Swallows coming in to roost on a gorse Fox-covert at Grainsby in September. I have not previously seen Swallows roost in gorse. Swallows decreased much in numbers on Oct. 9th, and I saw none after the 18th.

Ligurinus chloris (Greenfinch).—Appeared abundantly in the coast hedges on Oct. 18th.

Carduelis elegans (Goldfinch).—I saw no Goldfinches in the autumn, but on Feb. 8th, 1904, I observed a flock of about a dozen at Grainsby. On March 3rd they were abundant on some thistle-grown fields at Ludborough.

Passer montanus (Tree-Sparrow).—Some small flocks along the sea-bank, with House-Sparrows, on Dec. 24th.

Fringilla cælebs (Chaffinch).—Many Chaffinches—all cocks—in the coast hedges on Oct. 13th.

F. montifringilla (Brambling).—Very scarce; I saw none on the coast, but I noticed a large flock at Normanby on Dec. 10th.

Linota flavirostris (Twite).—Twites appeared abundantly in flocks on the sea-bank and "fitties" on Oct. 13th.

Sturnus vulgaris (Starling).—Were very abundant throughout the early part of the autumn. On Oct. 13th large flocks came in to the coast from E.

Corvus corone (Crow).—A flock of twenty close to the coast on Sept. 24th.

C. cornix (Grey Crow).—Many Grey Crows travelling N.W. along the Humber coast on Oct. 20th, and again on 21st; on the latter day till nearly four o'clock.

C. frugilegus (Rook).—Rooks came in in considerable numbers on Oct. 20th and the three following days, the direction of flight being E. to W. The end of the passage usually took place early in the afternoon, but on the 21st it continued till a quarter to four o'clock. A few Rooks again came in on Nov. 5th and 18th.

Alauda arvensis (Sky-Lark).—Not nearly so heavy a migration as last year. I noticed a good many coming in on Oct. 18th, and again on 26th, the direction of flight being N. to S.

Cypselus apus (Swift).—A very large flock of Swifts on the sea-coast on Aug. 11th. Last seen on Sept. 1st.

Caprimulgus europæus (Nightjar).—One was shot in a turnip-field near the coast on Sept. 21st, and another, also in turnips, at Grainsby on Oct. 4th.

Dendrocopus major (Pied Woodpecker).—I saw one on a dead tree at Tetney on Nov. 18th, and at the end of the month they were very numerous in the district.

D. minor (Lesser Spotted Woodpecker).—I shot a couple of these birds on Jan. 3rd, 1904, at Grainsby, and others are said to have been seen in the neighbourhood about the same time.

Alcedo ispida (Kingfisher).—First seen on Grainthorpe Haven on Sept. 4th. On Sept. 7th I put one out of a thick hedge near the sea at North Cotes, while on the 18th and subsequent days they were quite numerous in the vicinity of the coast.

Cuculus canorus (Cuckoo).—The last Cuckoo was seen at Grainsby on Sept. 10th.

Strix flammea (White Owl).—I saw a Barn-Owl in a plantation near the sea on Sept. 23rd.

Asio accipitrinus (Short-eared Owl).—On Oct. 13th one of

these Owls was found in a disabled condition under the telephone-wires near the North Cotes coastguard station. I kept this bird in confinement, and found that it would eat any bird or animal offered to it except a Rabbit.

Buteo lagopus (Rough-legged Buzzard).—On Oct. 15th I watched two of these Buzzards come in from the sea, and pass inland to the S.W. One of them appeared much exhausted, and perched on the ground several times, where it was at once mobbed by large flocks of Starlings. Two were seen and one shot on the Humber bank above Grimsby on 16th. The latter bird I saw at Jeffreys' shop at Grimsby. H. H. Kew, of Louth, also had one of these birds, which was shot at Worlaby on Nov. 19th.

Haliaeetus albicilla (White-tailed Eagle).—Though not strictly belonging to the autumn migration, it may be noted here that an immature Eagle of this species frequented the park at Grainsby for two days, on Feb. 27th and 28th, 1904.

Accipiter nisus (Sparrow-Hawk).—Several Sparrow-Hawks appeared in the vicinity of the coast on Sept. 11th, and again on 23rd. Most of them seemed to be young birds.

Pernis apivorus (Honey-Buzzard).—Mr. H. H. Kew, of Louth, showed me one of these birds, which had been killed at Tathwell on Oct. 10th.

Falco aesalon (Merlin).—I saw a Merlin on the sea-bank at North Cotes on Sept. 19th, and another on Oct. 7th near the same place.

F. tinnunculus (Kestrel).—Fairly numerous throughout the autumn, particularly about Sept. 11th.

Anser segetum (Bean-Goose).—I saw a flock of seven of these Geese flying low over Bradley Wood on Oct. 10th. One was shot at North Cotes on Dec. 9th.

A. brachyrhynchus (Pink-footed Goose).—First seen on Sept. 12th, a flock of about forty near the coast at Tetney; again, a flock of a dozen at North Cotes on Sept. 23rd. During the first half of October the flocks of Geese were quite numerous.

Cygnus bewicki (Bewick's Swan).—One of these Swans was shot at North Cotes by a wildfowler called Stubbs on Jan. 1st, 1904.

Spatula clypeata (Shoveler).—On Aug. 14th I saw two broods
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of Shovelers on a rush-grown creek at Tetney, which had no doubt been bred in the vicinity.

Nettion crecca (Teal).—I saw a few at Tetney on Aug. 14th, but Teal were extraordinarily scarce during the autumn.

Mareca penelope (Wigeon).—First flock of Wigeon seen at Tetney on Sept. 23rd.

Fuligula ferina (Pochard).—One was shot on the pond at Elkington Hall on Nov. 12th.

F. cristata (Tufted Duck).—A young Tufted Duck was shot at Elkington, in company with the Pochard above mentioned, on Nov. 12th.

Columba palumbus (Wood-Pigeon).—Large numbers of Pigeons came into the country between Nov. 15th and 23rd. Another immigration probably took place just before Christmas, but the great flocks continued to increase till about Feb. 8th, after which their numbers rapidly declined.

Turtur communis (Turtle-Dove).—Owing probably to the cold and wet weather, the bulk of the Turtle-Doves left before the end of August. I saw the last bird on Sept. 11th.

Rallus aquaticus (Water-Rail).—I saw the first Water-Rail at Tetney on Nov. 18th.

Charadrius pluvialis (Golden Plover).—The first flock of about a hundred came in from the north with Peewits on Oct. 9th. They were, however, scarce during the winter.

Squatarola helvetica (Grey Plover).—I saw a small flock of Grey Plovers at Marshchapel on Sept. 18th, and a larger one at North Cotes on 21st.

Vanellus vulgaris (Lapwing).—I first saw Peewits travelling on Sept. 30th, and a few were coming in throughout October. During November they were much more abundant, particularly about the 18th and 20th, but, probably owing to the large extent of flooded land, the decoymen were not very successful.

Streptilas interpres (Turnstone).—A single bird at Marshchapel on Sept. 18th.

Hæmatopus ostralegus (Sea-Pie).—Some large flocks appeared at North Cotes on Aug. 24th.

Scolopax rusticula (Woodcock).—The first Woodcock that I heard of was shot at Beelsby on Oct. 13th. I saw two at Antby on 17th. On the whole it proved a good Woodcock season.

Gallinago caelestis (Snipe).—Snipe were singularly scarce all through the autumn, but a considerable flight appeared on the coast on Dec. 3rd, with the sudden thaw of a heavy fall of snow.

G. gallinula (Jack-Snipe).—Jack-Snipe were also scarce. I shot the first at Tetney on Sept. 26th.

Tringa minuta (Little Stint).—A single bird of this species appeared at North Cotes on Sept. 4th, and another on 12th, while several were present on the 21st and 23rd.

T. subarquata (Curlew-Sandpiper).—Scarce; I saw three at North Cotes on Sept. 19th, and four on 21st, with some Little Stints.

T. striata (Purple Sandpiper).—Mr. Kew, of Louth, had a Purple Sandpiper which was shot at Marshchapel on Nov. 9th.

T. canutus (Knot).—A large flock appeared on North Cotes sands on Sept. 9th, but the principal immigration of the season took place on Nov. 18th, when very large flocks arrived.

Calidris arenaria (Sanderling).—I noticed a few of these birds on the sands at Donna Nook on Sept. 4th.

Totanus hypoleucus (Common Sandpiper).—The first Common Sandpiper appeared at Tetney on Aug. 11th.

T. glareola (Wood-Sandpiper).—I saw a Wood-Sandpiper at North Cotes on Aug. 21st, and shot one near the same place on Sept. 9th.

T. ochropus (Green Sandpiper).—First seen at North Cotes on Aug. 11th, and was quite numerous on 14th. Green Sandpipers became much scarcer by the middle of September, but I saw one or two at North Cotes on the 19th, and a single bird on Thoresby Fleet during a heavy snowstorm on Nov. 30th.

T. calidris (Redshank).—A good many Redshanks on Tetney Haven on Aug. 17th, and very abundant on 29th.

T. fuscus (Spotted Redshank).—I saw an example of this species at North Cotes on Aug. 21st, and another was caught by a Plover-catcher at Tetney on Sept. 4th.

T. canescens (Greenshank).—A few Greenshanks appeared on Tetney "fitties" on Aug. 17th, and they were quite numerous by the 21st. Few remained after Sept. 9th.

Numenius arquata (Curlew).—Curlews were abundant on the coast as early as Aug. 17th, though I saw none on the 11th.

N. phaeopus (Whimbrel).—Two or three Whimbrels on Tetney “fitties” on Aug. 18th. They were numerous both on the “fitties” and inland on 21st, and were last seen on Sept. 21st.

Sterna fluviatilis (Common Tern).—Terns were scarcer than usual. On Sept. 4th I saw a good many off Donna Nook, most of which were of this species.

S. macrura (Arctic Tern).—On Aug. 24th I noticed a flock of these Terns flying over the fields near the sea at North Cotes.

Stercorarius crepidatus (Arctic Skua).—Very scarce ; on Sept. 4th I saw two—both dark birds—off Donna Nook.

Podiceps fluviatilis (Little Grebe).—A good many Dabchicks appeared on Thoresby Fleet on Nov. 30th, at the commencement of a heavy fall of snow.

ORNITHOLOGICAL NOTES FROM KILLALA BAY AND THE MOY ESTUARY.

By ROBERT WARREN.

NOTWITHSTANDING the very mild and wet but stormy winter of 1903-4, the Wigeon appeared in quite as large numbers as in our most severe seasons, such as 1878-9 and 1880-81, flocks of five and six hundred birds being observed where one hundred and fifty to two hundred would be met with in ordinary years. Owing to the almost continuous stormy weather, very few were obtained by punt-shooters, the waters of the estuary being far too rough throughout the season for successful punt-gun shooting; and another cause that helped to protect the Wigeon from their enemies on the water was the fact that of late years they have changed their haunts by day, and instead of, as formerly, resting on the banks of the channels in various parts of the estuary, they now all assemble, along with Pintails, in one great company, on the sands outside the Island of Bartragh, resting just inside the breakers of the bar, where neither boat nor punt can approach them. Nothing can be more tantalizing to the shooter than to see those dense masses of fowl resting and sleeping, quite free from disturbance, within a few hundred yards, but perfectly unapproachable. Then at night they scatter about the banks of the estuary to feed, but there is scarcely any night shooting by moonlight, because the small extent of *Zostera* bank lying close to the land is quite shaded by the shadows thrown by the surrounding high land.

The Wigeon are well able to take care of themselves and avoid the shooters, and I quite agree with what Mr. Abel Chapman says of the Wigeon in his 'Bird-life on the Border,' p. 183, where he estimates that only from ten to fifteen per cent. of the great number that visit his district are obtained by shooters; while here I can safely say that in this estuary half his estimate would be nearer the number; so there is little fear of the

race of Wigeon being unduly diminished, either here or on the Durham and Northumbrian coasts.

In contrast to the large numbers of Wigeon observed this winter, Pintails were not nearly so numerous as last season, when flocks of one hundred to one hundred and fifty birds were to be met with; while this winter forty to fifty might be the average number seen in their usual haunts about the estuary. Pintails are very partial to feeding wherever fresh water runs down from the land, and on part of the sands near one of my fields a small flock of these ducks may be seen almost daily throughout the winter and spring, feeding where a little stream, after leaving the shore, spreads out on the sands. Pintails sometimes remain late into spring; last season I observed them on the sands up to the 23rd of April, while this spring I did not see them after the 25th. They become very much tamer as the spring season advances, much more so than Wigeon, and will allow me to walk up to one hundred and fifty or two hundred yards from where they rest on the sands, while Wigeon would not let me approach within twice that distance. This tameness is the more remarkable, because during the shooting season they are far wilder than Wigeon, and take alarm at the approach of a shooting-punt, rising long before Wigeon think of moving off. It is impossible to estimate the numbers of Wild Ducks in this district, because they do not leave their inland feeding-grounds for the sea-side unless driven down by severe frosts, and nothing less than eight or ten degrees of frost will cause their appearance in any numbers in the estuary.

They are extremely sensitive to changes of temperature, and on the slightest sign of a thaw after frost they all disappear that night from the estuary, returning to their inland haunts in bog and lake before morning. The greatest number of Wild Ducks that I ever saw was in the winter of 1880-81, when they appeared to be almost as numerous as Wigeon, but then they were frozen out of all their inland haunts.

The three species of waders—Green Plover, Curlew, and Golden Plover—have also increased very much, the two former enormously so; but the reason for this great increase in their numbers of late years is difficult to explain, though I may suggest that the great decrease of tillage farming, resulting in a vast

increase of pasture lands in this province, may be partly the cause of larger numbers visiting the district than in former years, because, as all these birds obtain the greater part of their food in the grass fields, and not on the sea-shore, the larger area of pasture land now affords them a greater abundance of food than in former years. I first noticed this great increase of Lapwings in October, 1879, when they appeared in countless numbers about the estuary, probably five or six times more numerous than in ordinary years. These immense flocks haunted the sands of the estuary by day while the moon was strong, but on the return of the dark nights they deserted the sands, and kept inland altogether until the return of the moonlight, and then resumed their habit of resting on the sands by day, but only to rest, not to feed. Ever since 1879 this large increase of Lapwings visiting this district has continued, but in some seasons they come in enormous numbers, notably so in October and November, 1899, when the numbers about the estuary were really astonishing, and were added to by a second wave of migration towards the end of the latter month. Early on the morning of the 20th, my friend the late Mr. A. C. Kirkwood, of Bartragh, saw an immense flock coming in from the north, passing over the island, and flying very high, but instead of pitching at once on the sands they kept flying about for a long time as if not knowing where to alight, being strange to the place; though after a time they pitched on the sands between Bartragh and Moyne Abbey, extending for nearly a quarter of a mile. Other flocks must have come in earlier that morning, because there were many large flocks also on the sands—one inside the bar on the bay side (where I never saw Lapwings before); on the Scurmore sands; on those off Moy View, Roserk, and Castleconnor—five large flocks, irrespective of the new arrivals off Moyne; and such a gathering of Lapwings I do not believe were ever seen before, at least not in this district. It was very remarkable all that week, that, although Lapwings were in such thousands on the sands, it was quite impossible to obtain shots at any of the large stands, their restlessness being so great, the birds always rising before a punt could approach within shot. These new arrivals appeared to have imparted this state of unrest to the birds previously haunting the sands—for instance, Mr. Kirkwood, who

was out with his punt and gun all day on the 20th, found it impossible to obtain a shot, although he was one of the most successful punt-shooters that I have known. I was out myself on several other days, and with the same bad luck ; there was no approaching within shot of any, except a few straggling birds from the tail of the flock, and these so few as not to be worth a shot. It is hard to account for this excessive wildness of birds usually so easily approached, more especially as the weather was so suitable for punt-shooting, being calm, dry, and mild, a most essential state of things for successful Plover-shooting.

This great increase in the Lapwing visitation appears to be made up mostly by strangers, for there is no apparent increase of our home-breeding birds in their summer haunts, and not more than the ordinary stock of Lapwings are observed where they begin to flock in July and August, returning from the breeding-grounds. The migratory flocks did not appear last season until the end of October, when on the 25th I observed a large flock flying very high, coming in from the north-east, passing over Bartragh, and continuing their course inland towards Foxford, probably for those grand feeding-grounds, the wide expanse of meadows along the River Moy. The arrivals continued all that week, for on enquiry of a man who has good opportunities for observing birds coming in from the north, he told me that nearly daily that week he had observed large flocks of Lapwings flying very high, coming in from the north, and passing inland to the south-west. There being very little frost during the past few winters, the Lapwings did not leave for southern haunts, as they usually used to do on the appearance of the first heavy frosts, but remained all through the winter, until leaving for their breeding-haunts in March.

Golden Plover have for the past eight or ten years visited us in greatly increased numbers, and stands of five hundred to a thousand birds are often seen where formerly two hundred to three hundred would be considered large stands ; indeed, one day last winter I saw a large flock hovering over the Rinroc Sands that certainly could not have numbered less than two thousand birds. When out in my shooting-punt in the early mornings, I have been very much interested watching the Golden Plover assembling on the sands after their night's

feeding in the fields; a little after eight o'clock they begin dropping in from all directions, in little flocks of from five up to fifty birds, until about ten o'clock, when all are assembled in one great stand, where they remain resting until just before dusk, when they become very restless, and, after rising and pitching a few times, all leave, and, separating into little flocks, scatter all over the country to their several feeding-grounds. If not associating with Curlew, the punt-shooter can almost always calculate on obtaining a shot at Golden Plover, provided he has water enough to float him within shot; but if Curlew are with them he has no chance whatever, these birds rising and scaring the Plover long before he is within shooting distance. However, I have sometimes managed to obtain a shot, after driving off the Curlew without scaring the Plover, by paddling slowly by, two or three hundred yards from the flock; then the Curlew begin to get suspicious and leave in small lots, dribbling slowly away until all have left, without alarming the Plover; but if I paddled by too close, all the Curlew would have risen together and taken the Plover away with them. The foreign-bred Golden Plover often remain here long after our home-bred birds have left for their breeding haunts. On April 25th, 1901, I met, in a field at Doneen, near this place, a flock of over a hundred birds, all in the black-breasted breeding plumage, and they were so remarkably tame as to allow me to walk up within twenty or thirty yards to observe them, evidently showing that they were fatigued by a long flight from the south, and were resting before continuing their northern flight.

The Curlew is another bird that has increased enormously of late years, but not by any increase in our home-bred birds, for in the breeding-season they are scattered very thinly over their vast extent of breeding grounds. The immense flocks that appear on the sands in autumn are almost incredible, and should be seen to be believed in. One day this past winter I saw on the wide expanse of sands already spoken of as haunted by the Golden Plover, absolutely acres covered by immense flocks of Lapwings, Golden Plover, Curlew, and Godwits—a sight that must be seen and not imagined. It was the largest assembly of land-birds that I ever saw. To give some idea of the numbers of Curlew seen that day, there was a flock on the "White

Strand," the Scurmore Bank, the Castleconnor Bank, the Roserk Bank, and the Bank here off Moy View. I attempted to count the latter, but got confused when I came to a hundred, and there were certainly ten times that number; so, without exaggerating, I may safely estimate that flock as consisting of a thousand birds, and this was only an average-sized flock compared with the others.

NOTES ON A FEW BIRDS, CHIEFLY MIGRATORY AND NOMADIC, OBSERVED IN THE VICINITY OF HOBART.

BY JAMES R. McClymont, M.A. (M. Austral. O. U.).

TWELVE months' residence in the vicinity of Hobart yielded opportunities for studying the habits of several birds which visit the south of Tasmania.

Pallid Cuckoos (*Cuculus pallidus*) were first observed on Aug. 30th, 1902. On that day two birds were seen to arrive at a high rate of speed; after settling on several trees in succession they continued on their way, and were speedily lost to view in the bush which clothes the hills that border the western shore of the Derwent. The Dusky Robin (*Petræca vittata*) was the only foster-parent of Pallid Cuckoos, which I knew to be nest-building in the district at this time. Four weeks later at least two others of their foster-parents were building near us, namely, the New Holland Honey-eater (*Meliornis novæ-hollandiæ*), and the Yellow-throated Honey-eater (*Ptilotis flavigularis*). Whether Cuckoos of this species have paired before their arrival in the south of Tasmania, or arrive there unmated, has, I believe, not been ascertained. Nor is it known whether the return journey is made by males and females together, or separately. As will appear shortly, young and old birds may not migrate in company. Pallid Cuckoos appear to be regarded with curiosity by various small birds. On one occasion a small bird was seen fluttering before a new-comer, as if under the influence of irresistible attraction. On another occasion a Yellow-throated Honey-eater was seen to dart repeatedly at a Pallid Cuckoo—strange conduct which evoked no demonstration of hostility from the migratory bird. At first I ascribed the movements of the Honey-eater to sportiveness, but when, on a subsequent day, a bird of the same species suddenly darted at my head, I came to

the conclusion that inordinate curiosity was the real motive of these strange actions.

The last Cuckoo of the season was seen on March 9th—a young female bird, clad in the variegated feathering which may be regarded as the ancient garb of the tribe. For several days it had been flitting restlessly from one perch to another, as if uncertain in which direction to take flight. At last it was fired at, flew away, apparently uninjured, on the right course, but in its agitation must have come in violent contact with a tree or other obstacle, for it was found dead near the place where it was last seen alive. No mature Cuckoos had been seen for several weeks.

Spine-tailed Swifts (*Chætura caudacutā*) were not observed until March 21st, when three or four were seen flying low. They passed by so near that one could hear the whizzing of their wings very distinctly—a thrilling and eerie sound, comparable to no other sound that I know in the whole realm of birds. The largest number seen at one time—about thirty in all—passed northwards on the 22nd of the same month, but solitary birds returned southward from time to time, coursing through the air with matchless velocity. Welcome Swallows were generally present at the same time. The last Swift was seen on April 8th. They remained longer in the north of the State, and appear there with greater regularity and in greater numbers.

In not a few families the shafts of the rectrices are stiff, and in some are also somewhat sharp at the ends. They are so with the Woodpeckers, in certain of which (as *Colaptes*) these feathers are also acuminate. The stiff shafts facilitate the ascent of tree-trunks, or the maintenance of a stable position upon the trunk. In the Spine-tailed Swift the ends of the shafts are veritable pin-points, capable of penetrating the skin and drawing blood. The use which the Swift makes of these sharp-pointed shafts is, I believe, unknown. If, in a matter of this sort, the argument from analogy is of any value, they must be used to assist the bird to cling, not to the boles of trees, but to some perpendicular surface of great hardness, such as that of a precipitous cliff.

The Swift Lorikeet (*Nanodes discolor*) was the only member of the order of the Parrots which I encountered during the period embraced by this article. On Aug. 17th the opercula

began to fall from the blue gums, and on the following day a reconnoitring party of Swift Lorikeets appeared, but only remained for a few minutes, as the season of blossom was not yet sufficiently advanced to yield their food. We saw no more of them until Sept. 14th; from that day until the end of November they visited the blue gums in our quarter every day. The latest blossom then withered, and we saw no more of the Lorikeets. During the time of their visits Crescent Honey-eaters were also plentiful, and the two species were often to be seen in the same tree. The flower-cups of the blue gum (*Eucalyptus globulus*) are infested by a small ant, and by a winged insect so minute that it appears like a mere mote to the unaided human eye. When shaken out of the anthers it recurves the after segments of its body, and uses these to disengage its wings, which have been glued to its body by the sticky juices of the flower-cup from which it has been expelled. When it has accomplished their liberation the insect flies away. I doubt if even in the flying stage of its existence it is safe from pursuit by the Crescent Honey-eater, for this bird darts upon flying insects like a Flycatcher. I have also seen them, when they were stationed in a bush, protrude their tongue in the manner of Lizards, as if for the purpose of seizing insects with that member.

Swift Lorikeets visit several of the city reserves when the blue gums are in flower, and make their presence known chiefly by their whispered notes, for their plumage accords well with the colour of young leaves which receive unobstructed light. Swift Lorikeets therefore generally elude observation, except when they are flying from tree to tree over an intervening clear space. If a Butcher-bird appears within their range of vision, the whole troupe takes flight precipitately with loud outcries.

I conclude with a list of the species which I observed, or of which I obtained skins, during the time spent in the vicinity of the city. The list, of course, is not exhaustive even of the common species of the district. Several of those which are included in the list do not nest on the western shore of the Derwent, but in the gullies of Mount Wellington and other eminences. To the names of subspecies or insular varieties I have added, in brackets, the name of the species to which they are most nearly allied. In addition to the birds enumerated, an

Albatross and one or two small Cormorants were seen, but not identified, and the Bronze Cuckoo (*Chalcococcyx plagosus*) was heard on Nov. 19th, 1902.

The indigenous species which were identified were the following:—*Hieracidea orientalis*, *Ninox maculata*, *Corvus coronoides*, *Collyriocinclla rectirostris*, *Graucalus parvirostris* (*G. melanops*), *Petroeca leggii*, *P. phænicea*, *P. rhodinogastra*, *P. vittata*, *Malurus gouldi*, *Rhipidura diemenensis* (*R. albiscapa*), *Geocichla macrorhyncha*, *Acanthiza diemenensis*, *A. chrysorrhoa*, *Sericornis humilis*, *Calamanthus fuliginosus*, *Gymnorhina hyperleuca* (*G. leucota*), *Cracticus cinereus* (*C. destructor*), *Pachycephala glaucura*, *P. olivacea*, *Acanthorhynchus tenuirostris*, *Ptilotis flavigularis*, *Meliornis australasiana*, *M. novæ-hollandiæ*, *Acanthochæra inauris*, *Zosterops cærulescens*, *Melithreptus melanocephalus*, *Pardalotus punctatus*, *P. quadragintus*, *Hirundo neoxena*, *Anthus australis*, *Zonæginthus bellus*, *Chætura caudacuta*, *Podargus strigoides*, *Cuculus pallidus*, *Cacomantis flabelliformis*, *Nanodes discolor*, *Phaps chalcoptera*, *Larus pacificus*, *L. novæ-hollandiæ*, *Sula serrator*, *Phalacrocorax carbo*, *P. gouldi*, *Eudyptula minor*.

And the British species:—*Passer domesticus*, *Carduelis carduelis*, *Sturnus vulgaris*, *Alauda arvensis*.

Hobart, Tasmania.

NOTES AND QUERIES.

MAMMALIA.

Notes on the Noctule (*Pterygistes noctula*).—On July 2nd a friend and I took five Noctules out of a hollow willow-tree, about twenty feet up, at Esher, Surrey. A week later we visited the tree again, and took four more. What struck me as being remarkable was that all the Bats taken were males. Mr. Lydekker, in his 'Handbook on the British Mammalia,' says:—"It is stated that when hybernating in winter the Noctule generally associates, after the manner of many of its kindred, in separate colonies of males and females; such, at least, being the experience of Mr. J. Gurney, who further states that the number of females is greater than that of males." This certainly has not been my experience; I have always found the males far commoner. In a previous year I took several out of a hollow elm-tree at Milford, Surrey, and to the best of my recollection they were all males. Do the sexes, then, only come together in the breeding season, and is this common to all species of British Bats?—GORDON DALGLISH (29, Larkfield Road, Richmond, Surrey).

Whiskered Bat in Oxfordshire.—A Whiskered Bat (*Vespertilio mystacinus*) flew into one of the rooms here on the night of July 20th. Curiously enough, the last I saw flew into the same room on July 19th, 1901. There are shrubs just outside the window, and numbers of moths come into the room on warm nights, attracted by the light. It seems probable that this Bat feeds largely on moths.—O. V. APLIN (Bloxham, Oxon).

AVES.

Blackbird singing from a House-top.—Mr. Belcher's note (*ante*, p. 262) reminds me that when at Interlaken last summer I frequently noticed Blackbirds singing from the house-tops, perched either on a chimney or a gable. It struck me at the time as remarkable, and a thing which I had not observed in England. In the British Islands, however, those two most aggressive species, *Passer domesticus* and *Sturnus vulgaris*, so effectually assert a peculiar right to the house-tops

that the shy Blackbird is probably excluded. At Interlaken, in summer, all birds are remarkably tame, the Starling is not found, and the House-Sparrow seems not nearly so numerous or impudent as in English towns. The Song-Thrush is absent, being a bird of the forests and mountain slopes at the nesting-time, but the Blackbird is common, and its song seems particularly powerful and melodious. — ALLAN ELLISON (Watton-at-Stone, Herts).

Robin nesting in a Tree or Hedge.—Referring to my former note (*ante*, p. 190), and the further notes which have been made on this subject, I would remark that for a Robin to build in a hedge would not necessarily be such a deviation from its usual nesting habits as was exhibited by the nest which I have described. If the hedge were a compact and closely trimmed one, and more especially if it had a sloping front, a nest built in some recess or niche might be situated almost similarly to the usual Robin's nest on a bank-side, or in some hole of an ivy-clad wall; or a Robin's nest in a hole in the trunk of a tree not far from the ground would not have struck me as very remarkable. But the case of a nest in an isolated tree, and equally exposed on all sides, is entirely different. On p. 191 I have compared the site to that of a Greenfinch's nest, and, curiously enough, soon after the Robin's nest was removed a pair of Greenfinches commenced building in the very same spot. I showed this nest to the choir-boys, who were very interested to hear of a Robin's nest having been built there, and promised to protect the Greenfinch's nest. This they did most faithfully, and the Greenfinches successfully reared their brood.—ALLAN ELLISON (Watton-at-Stone, Herts).

The Little Bunting (*Emberiza pusilla*) in England.—Last winter I acquired a living example of the Little Bunting, which had been captured with birdlime at Pailton, near Rugby, in the beginning of October, 1902. It died a short time after I had acquired it, having passed altogether about fifteen months in captivity. It was skinned by Messrs. Williams & Son, of Dublin, who pronounced it to be a male. On the authority of Mr. Aplin, who very kindly identified the skin for me, this is the fourth example of the Little Bunting obtained in Great Britain. The first of these was taken alive near Brighton on Nov. 2nd, 1864. I have also in my collection the male Meadow-Bunting (*Emberiza cia*), which was captured alive near Thoresham at the end of October, 1902, but which, unfortunately, only survived a few months. A second bird of this species was also obtained at the same time, but perished shortly afterwards, and the skin, I understand, was not preserved. Dr. Bowdler Sharpe, who examined the bird now

in my possession, stated that this was the first appearance of the Meadow-Bunting in Great Britain, and made an addition to the British list (*cf.* Bull. British Ornithologists' Club, No. xciv. pp. 88, 89).—C. J. CARROLL (Rocklow, Fethard, Co. Tipperary).

Albinism in the Magpie.—I have recently added to my collection an albinic example of the Magpie (*Pica rustica*). This bird, which is immature, was captured with birdlime at Kirbymoorside, in Yorkshire, on June 4th last, but died from inanition a week later. The plumage is pure white throughout; the feet, legs, and beak are also white; and the eyes, as in all true albinos, are pink. I have only two previous records of albinism in the Magpie—one for Cornwall, and the other for Wexford.—C. J. CARROLL (Rocklow, Fethard, Co. Tipperary).

Young Cuckoo in a Twite's Nest.—With reference to the note by Mr. Wilson (*ante*, p. 264), giving the history of a young Cuckoo in a Twite's nest, it might be pointed out that the occurrence of a young Cuckoo in the nest of a Twite would be in itself a very interesting and unusual fact, and also that May 25th would be a rather early date for a young Cuckoo to be hatched out, at least as far north as Aberdeenshire. May 1st is mentioned as the date of the bird's first appearance in that neighbourhood this year. If the identification was correct, a far more interesting question in connection with the occurrence would have been as to how the Twites were capable of feeding a young Cuckoo, and whether the death of the latter may not have been due to the fact that they did not give it its natural insect-food. The Twite is not an insectivorous bird, and, in common with the Linnet, Redpoll, Goldfinch, Greenfinch, Bullfinch, and other seed-eating Finches, feeds its young by disgorging seeds already partly digested in its own crop, although the adult birds doubtless at times eat insects as well as seeds. I have often watched these seed-eating Finches in the act of feeding their young, and so closely that I could see the food, a white creamy substance being passed by the parent bird into the open gapes of the nestlings, each of which received a full meal on the visit of the parent bird to the nest. Is a young Cuckoo capable of being fed in this way, and, if so, can it be successfully reared on such food? I should like to know whether any good field naturalist has ever settled this question. It is well known that the usual foster-parents of the Cuckoo are the small insect-eating birds, but the Cuckoo has been known to deposit its egg in the nest of one or other of the seed-eating Finches, but whether the latter are successful in rearing the young intruder is a different matter. Occasionally the Cuckoo entrusts its young to the

care of one of the Buntings, but these birds, although largely seed-eaters, feed their young on insects and grubs, as I know from frequent observation. The statement is made that in this case the young Cuckoo was very like the young Twites, but with a larger mouth. Now, as the Cuckoo's egg is about three times the size of a Twite's, and the young Cuckoo grows with great rapidity, the superior size of the latter would be at once apparent. The suggestion that the Cuckoo could have devoured the flesh of its own young one is improbable. The soft bill and wide gape of the Cuckoo are adapted for capturing the large insects and caterpillars which form its food, and which the bird swallows whole, and it could not tear the flesh from the bones of a young bird so as to leave the skeleton bare, even if it had the will to do so.—ALLAN ELLISON (Watton-at-Stone, Herts).

[Mr. Wilson's observations on young Cuckoos being found in the nest of the Twite, which acts as a foster-parent, have now been continued for a number of years, and detailed in these pages. He has also raised the problem of suitable food referred to by Mr. Ellison, *supra*; cf. Zool. 1897, p. 865; 1898, pp. 270, 859, and 481; 1900, p. 481; and 1902, p. 854. He has also frequently expressed the opinion, based on his own observations, that near Aberdeen the Twite is the most usual foster-parent of the Cuckoo. We have every confidence in Mr. Wilson's observations.—ED.]

The Kite in Cheshire.—Although the Kite (*Milvus iclinus*) nested in Cheshire at the end of the eighteenth century, as we learn from a remark of the first Lord Stanley of Alderley, who says, when describing Alderley Park in a letter written in 1791, "The silence that reigns there is only broken by the shrieks of the large Kites, which constantly build their nests in the neighbourhood, and the calls of the Teal and Wild Duck to each other on the mere" ('The Early Married Life of Maria Josepha (Holroyd), Lady Stanley,' p. 100), the visits of the bird to the county had become infrequent by the middle of the last century. It is therefore worth noticing that a hitherto unrecorded specimen of a Kite killed in the county is in existence. This bird, which is in immature plumage, was shown to me by Mr. Thomas Davies, of Lymm, who shot it at Booth Bank, Millington, in "the forties." He killed it in the month of August, and, though interested in birds, had on no other occasion seen a Kite in that locality.—T. A. COWARD (Bowdon, Cheshire).

Night-Heron in Lancashire.—Mr. Davies, of Lymm, Cheshire, has in his possession an adult Night-Heron (*Nycticorax griseus*) which was killed at Newton-le-Willows some "ten or twelve years ago." Mr.

Davies, when he showed me the bird, told me that he had it in the flesh from the man who shot it, and that he set it up himself. The Night-Heron is of very casual occurrence in both Lancashire and Cheshire.—**T. A. COWARD** (Bowdon, Cheshire).

Ornithological Notes.—As I was leaving my brother's residence on Shooter's Hill, Plumstead, early one morning about the third week in June, he pointed out to me a pair of Swifts, which were breeding in the nest of a House-Martin. It is rather singular that this species should not breed in this immediate neighbourhood; it has made one or two attempts, but unsuccessfully. It is, however, by no means uncommon; especially is this so on fine evenings in July, when they may be seen hawking for flies at a great height. One of my sons last June showed me a nest of the Grey Wagtail built near a waterfall, and which contained a clutch of eggs, all of which were white. He also informed me of his finding a Cuckoo's egg in the nest of a Twite, which is the first instance I have known in this district, although I was informed some time ago by Mr. Wilson that this is by no means an uncommon occurrence near Aberdeen. The egg in this instance was of the type usually found in this district, and which approximates in colouring to that of the Sky-Lark. A light variety of the Cuckoo's egg was lately shown me, which had been found in the nest of a Meadow-Pipit, which contained dark eggs, even for this species. I have only once previously met with this light variety of Cuckoo's egg, and it was deposited in the nest of a Titlark, which contained abnormally light-coloured eggs, similar to those of a Pied Wagtail.—**E. P. BUTTERFIELD** (Wilsden, Yorks).

Birds singing at Night.—On July 15th a Hedge-Sparrow was singing in Teddington at 10 p.m., and I heard one in Richmond on the same night at 11 p.m. On the 16th and 17th, while I was staying in Milford, Surrey, I was surprised to hear a Wren singing loudly at 11.15 p.m. (this was on the 16th), and on the night of the 17th a Turtle-Dove was cooing at 12 p.m. The only other birds I have heard singing at night, with the exception, of course, of the Nightingale, were the Sky-Lark and Cuckoo. I wonder if the very hot weather we have been having lately had anything to do with the birds being restless and awake.—**GORDON DALGLISH** (29, Larkfield Road, Richmond, Surrey).

Bird Slaughter for Feminine Fashion.—This silly craze for the decoration of ladies' hats with the feathers and skins of unfortunate birds killed in the breeding-season, and thus leaving their young

ones to suffer the slow and cruel death by starvation, is really too bad ; and there is no safety even in the close-time, as an advertisement in the 'Irish Times' of the 15th and 16th inst. shows, *viz.* : "Some hundreds Terns (Sea-Swallows) required for stuffing ; 6s. per dozen given." Is there no way of saving our lovely Terns from such wholesale destruction ? The offer of sixpence each is quite enough to tempt idle fellows to shoot them down at the breeding-grounds, and when, to my certain knowledge, even on July 31st, the end of the close-season, fully one-third of the young birds will be still unable to fly, and in consequence will starve to death if the parents are destroyed. The close-season for sea-birds ought to be extended to Sept. 1st, in order to give time for the late breeding birds to get safe away from the breeding-grounds.—ROBERT WARREN (Moyview, Ballina).

NOTICES OF NEW BOOKS.

The Natural History of some Common Animals. By OSWALD H. LATTEB, M.A. Cambridge: at the University Press.

THE author of this volume recognizes the need for a new departure in the elementary teaching of zoology. When we take stock of the tangled mass of information which constitutes what we are pleased to call our scientific knowledge, we cannot fail to regret its many imperfections, its detail as regards the organism combined with its ignorance of the status of a living creature. We find ourselves either systematists, comparative anatomists, philosophical evolutionists—anything but sympathetic students of another animal life than our own; in fact, we have bartered our knowledge of living creatures in order to become museum specialists. And if we retrace our studies to their starting-point, we shall soon discover our infirmities as due to the original sin in teaching. We have dissected the animal for structural knowledge; have compared it with its allies for taxonomical purposes; have theorized over its appearance in connection with its environment; have looked at it in every other way than as a fellow living creature, with a problem of existence as difficult to understand as that of our own. We have been simply regarding organized automata, or copying the vices of the old historical method. However, the writing on the wall is—back to nature, and the bionomical method will come by its own.

Mr. Latter, in the preface, gives us his conclusion, that “Sixteen years’ experience has convinced me that we have been too closely wedded to structure, and have wrongly divorced function from our elementary courses of instruction. Structure alone is very liable to become dry bones in very deed, and consequently to fail to attract that interest without which good work is almost impossible.”

In order to advance this new teaching of zoology, which may

be likened to acquiring a knowledge of everything of something, in order to have a general knowledge of everything. Mr. Latter has chosen a few animal types as the best to suit his purpose. These are the Earthworm, Leech, Crayfish, Cockroach, Dragonfly, Wasp, Fresh-water Mussel, Snail, Slug, Frog, Toad, Newt, and some common internal parasites of domestic animals, and of these he has given us a full biological and bionomical narrative, phenomenally free from prevalent theoretical conclusions. Thus we are told of the enemies and parasites which destroy these creatures, but are spared the recital of ingenious guesses as to non-apparent protective or mimicking disguises which may or may not act as deterrents. In fact, we know of scarcely any other publication in which so much information is given as elementary, which in some points may have remained beyond the purview of advanced students, and without the intention, but with all the risk of being considered encomiastic, we heartily recommend this volume to the ever-increasing confederacy of young zoologists.

Manuale di Ornitologia Italiana. Del Conte Dott. E. ARRIGONI
DEGLI ODDI. Milano: Ulrico Hoepli.

In these pages (1902, p. 357) we drew attention to the larger work, 'Atlante Ornitologico,' written by the author of the above Manual, and we now welcome this very portable handbook to the birds of Italy. The same thoroughness in introduction to the general subject is found in both volumes, though, in this Manual, abbreviation has, of course, been found necessary; but the general method is similar, and the diagnoses are particularly clear and sufficient. To most English visitors to Italy, "all roads lead to Rome," but to those who can for the time forget this fount of classicalism, and pursue the paths of ornithology, this *vade mecum* must and will prove a necessary and valuable companion. In size it is well adapted to the valise, but perhaps requires stronger binding, and we congratulate its writer on the production of some nine hundred small octavo pages, which are adequately informative, and in the best sense constitute a 'Manuale di Ornitologia Italiana.'

Faune Entomologique Armoricaine. Hémiptères, Hétéroptères.
Par J. GUÉRIN et J. PÉNEAU. Rennes: Fr. Simon, suc-
cesseur de A. le Roy.

"Des Hémiptères bretons" belong to a now no longer neglected order of insects, but distinctly to an unenumerated local fauna, and Messrs. Guérin and Péneau have done well in commencing this work, while we are glad to read that the "Conseil de l'Association française pour l'Avancement des Sciences" have made a grant of four hundred francs to the authors of the 'Faune Entomologique Armoricaine' to accelerate the publication of their work. This first instalment deals with the Families *Pentatomidæ*, *Coreidæ*, and *Berytidæ*, and figures are given of all the species, though the printing of the same is a little crude. The classification in the last catalogue of Puton is followed, and the publication is prepared with care, and will doubtless prove of great value as describing the Rhynchota of a most interesting portion of France.

EDITORIAL GLEANINGS.

THE homeward-bound liner, 'Ville de Maranhao,' brings seven Chimpanzees and a young Gorilla ticketed for the Pasteur Institute in Paris, where they will be taken in hand by the celebrated Professors Metchnikoff and Roux, in connection with the study of various diseases common to men and women. The Apes are in charge of M. Rousseau, a high functionary of the French Congo.—*African World*.

WE have received the Report of the Transvaal Trout Acclimatisation Society, from the energetic Secretary, Mr. H. A. Fry, of Johannesburg:—

"The first attempt at introducing Trout into the Transvaal was made by Sir Percy Fitzpatrick, who, in October, 1900, obtained some two hundred and fifty fry from the Cape Government Hatchery at Jonkershoek, near Stellenbosch, which he brought with him by rail to Johannesburg. Owing to the state of war which then prevailed, and the consequent delays in railway travelling, great difficulty was experienced in keeping the fish. Nevertheless, a fair number survived the journey through the Cape and Orange River Colonies. At Elandsfontein, however, the fish were delayed a long time with disastrous results, and, owing to the impossibility of telegraphing, no satisfactory arrangements for their reception had been made, with the result that the few fish which did reach Johannesburg all died.

"By far the most destructive creature to young fry is the Water Toad (local name, *Plaatanna* or *Plaatje*), a web-footed, slimy-looking amphibian, with rather a pointed head. I do not consider they can do much harm in a river, but in a fry-pond they are very destructive. I have taken as many as thirty-two fry from the stomach of one of these Water Toads, caught in one of my fry-ponds in Cape Colony. As the fry-ponds can easily be protected with wire-netting, the danger is reduced to a minimum.

"The same remark applies to Kingfishers, which can be kept in check by a judicious use of the shot-gun."*

* We are sorry to read this, for Kingfishers are none too plentiful even in the Transvaal.—Ed.

THE ZOOLOGIST

No. 759.—September, 1904.

TASMANIA: ORNITHOLOGICALLY CONSIDERED.

By FRANK M. LITTLER, M.A.O.U., F.E.S.

THE Island of Tasmania, lying to the south-east of Australia, is separated from the mainland by Bass Strait, which contains several groups of small islands, whose avifauna closely resembles that of itself. Some of the islands dotted about the strait are Cape Barren, Flinders, the Hunters, Three Hummock, Robbins, Furneaux, and last, but not least, King. All these islands present points of interest to the naturalist.

The birds of Tasmania present many features of interest to the ornithologist; though, compared with tropical countries, or some other areas of similar size, the number of species is but small. Then, again, being as it is the far end of the Australian "region," its shores are not visited by any great number of northern migrants, whose wanderings cease with the southern extremity of the mainland. But, notwithstanding all these disadvantages, the avifauna of Tasmania well repays the trouble one takes to study it.

There are large tracts of country where bird-life is exceedingly scarce, such as on the west coast, where the lofty forest-trees and the heavy jungle-like undergrowth are totally unsuited for it. In nearly all the other portions of the island, however, birds are plentiful; but one does sometimes meet with stretches of country quite destitute of bird-life, even though all the conditions are apparently favourable. The indiscriminate and wholesale "ringing" of trees and firing of scrub has sadly reduced the number of species in several districts. This applies

more especially to the Wrens, Tree-Tits, and other small Passerine birds.

Including accidental and doubtful visitors, but excluding introduced species, some two hundred and fourteen species have been recorded for Tasmania and its dependencies. Of these, twenty species are, with a few exceptions, insular forms of birds found on the mainland. The species "peculiar" to Tasmania are: Hill Crow Shrike (*Strepera arguta*), Whistling Shrike Thrush (*Collyriocinclla rectirostris*), Small-billed Cuckoo Shrike (*Graucalus melanops* subsp. *parvirostris*), Dusky Fantail (*Rhipidura diemenensis*), Long-tailed Blue Wren (*Malurus gouldi*), Dark-blue Wren (*M. elizabethæ*), Large-billed Ground Thrush (*Geocichla macro-rhyncha*), Tasmanian Tit or Brown Tail (*Acanthiza diemenensis*), Ewing's Tit (*A. ewingi*), Large-billed Tit (*A. magnirostris*), Scrub Tit (*Acanthornis magna*), Brown Scrub Wren (*Sericornis humilis*), Lesser White-backed Magpie (*Gymnorhina hyperleuca*), Grey Butcher Bird (*Cracticus destructor* subsp. *cinereus*), Grey-tailed Thickhead (*Pachycephala glaucura*), Strong-billed Honeyeater (*Melithreptus validirostris*), Black-headed Honeyeater (*M. melanocephalus*), Yellow-throated Honeyeater (*Ptilotis flavigularis*), Yellow Wattle Bird (*Acanthochæra inauris*), and the Forty-spotted Pardalote (*Pardalotus quadragintus*).

Nearly the whole of the species in the above list are but insular representatives of mainland species. In several instances the island birds have longer bills than those on the mainland; but in one, the Small-billed Cuckoo Shrike, the reverse is the case. In nearly every instance, the species "peculiar" to Tasmania are of a sturdier build than their mainland cousins; but by some strange freak the Lesser White-backed Magpie is smaller than the White-backed Magpie (*G. leuconota*) found ranging over a wide area on the mainland.

Commencing with the *Falconidæ*, we find some sixteen species recorded. The only one worthy of a passing mention is the Wedge-tailed Eagle (*Uroæetus audax*); this fine bird is rather plentiful—too plentiful—in some parts of the island, where sheep are the only animals that thrive among the rocks of the uplands. To shoot birds measuring from 6 ft. to 7 ft. 6 in. from tip to tip is no uncommon occurrence. This Eagle often becomes very bold, not hesitating to attack dogs, even when in close proximity to

their masters. The natural food of this species consists of Marsupials (young Kangaroo, Wallaby, Kangaroo-rats, &c.), and many of the larger species of birds. It nests in some lofty eucalyptus tree, or on the edge of a high cliff, most frequently well out of the reach of any inquisitive oologist. The *Bubonidæ* with two species, one a doubtful one, next claim our attention. The Boobook Owl (*Ninox boobook*) is only doubtful, inasmuch as I suspect it has really never been found in Tasmania. I might explain, that when I use the words "doubtful species" I do not mean that the species as a species is doubtful or not a well-marked one, but simply that its presence on any list of Tasmanian birds is a matter for enquiry. But to return to the Boobook Owl: I have never met with it, nor have I come across anybody who has; yet its name appears in several lists of Australasian birds as having been recorded from Tasmania. But too much reliance must not be put on that, as we know of many instances of scientific writers copying one another's errors for many years. There is no reason why this Owl should not be found here; it is for that reason I have allowed it to remain on my list.

Among the *Corvidæ*, the Hill Crow Shrike (*Strepera arguta*) requires notice. This species belongs peculiarly to Tasmania, not even being found on the adjacent islands. It was doubtless on account of its fine ringing notes that Gould gave it the specific title *arguta*. The notes "clink, clink," several times repeated, are said to have reminded him of the distant sound of the strokes of a blacksmith's hammer on the anvil. On a clear still day the notes can be heard to a great distance. It is by no means a common species, nor is it distributed throughout the island. The southern portion seems to be most favoured. The chief point of difference between this species and *S. fuliginosa* is that the under tail-coverts are white.

The nest, which is placed in fairly tall eucalyptus, is constructed of sticks and twigs, and lined with rootlets and grass.

Passing on until we come to the *Prionopidæ*, we find the Whistling Shrike Thrush (*Collyriocincla rectirostris*), or, as it is sometimes called, Selby's Shrike Thrush. This interesting species is confined to Tasmania and some of its dependencies in Bass Strait. I much regret to say that in some parts of

Tasmania it is becoming very scarce, owing chiefly, I think, to the indiscriminate burning of scrub.

To most Tasmanians this bird is familiarly known as the "Whistling Dick," on account of its noisiness and general cheerfulness. In some districts this Shrike Thrush is fairly plentiful. It always makes its presence known, long before it can be seen, with its loud and cheerful whistling notes. The denser portions of the scrub are mostly favoured by this bird; it is rarely seen in the open, except when passing across a cleared portion of the forest to get into the scrub on the other side. Caterpillars and insects of divers kinds, especially those to be found under the bark of trees, constitute its principal food. On account of its powerful bill, it is enabled with ease to strip the loose bark from the limbs and search out its prey. In those districts in which it is not disturbed by the sportsman's gun, it is not at all shy, allowing one to approach to within reasonable distance for the purpose of watching it at work. Occasionally individual birds may be seen in cleared portions, and feeding round settlers' homes.

The Small-billed Cuckoo Shrike (*Graucalus melanops* subsp. *parvirostris*), in the family *Campophagidae*, next deserves attention. This bird is found on many of the islands in Bass Strait in addition to Tasmania. It differs from *C. melanops* in having the bill slightly smaller, and the grey upper surface slightly darker. The common vernacular name of this bird is "Summer Bird." Why it goes by this name I know not, as it does not leave the island altogether in the winter. There are many districts to which it is only a summer visitor, disappearing completely as soon as the first frost whitens the ground. It is only within the last few years that it has appeared round Launceston in the winter. During June, 1899 (mid-winter), I came across an unusually large flock, consisting of twenty birds, feeding on the ground in the bush just outside Launceston. As there are several districts in Tasmania much warmer in winter than others, the "Summer Bird" congregates there until spring comes round again, when it returns to its former haunts. Parts of the east coast and the north-west corner of the island are its favourite winter resorts. During the breeding season, which lasts from October to December, it generally goes in pairs; at other times small flocks of from six to ten are usually to be

seen. Large flocks of twenty and upwards appear only during the winter months. It is tamer in winter than at any other season of the year, often allowing one to approach within a short distance. Its food consists of insects of every description, which it captures either in the air or by searching among the leaves and rubbish on the ground. This bird has no song, but has a variety of notes, which are used on different occasions. The most noticeable one is loud, shrill, and somewhat harsh. This is mostly used as an alarm or call-note. When first I heard this note I could not make out from what species of bird it emanated, it being so different from any heard before. The notes uttered during the breeding season are soft and somewhat sweet; they vary greatly, sometimes resembling a cooing sound. Lastly, there are the notes in general use. These are hard to describe, but if once heard, can never be mistaken for those of any other species; they are very peculiar, and not on the whole unpleasing. When on the wing, soft whirring notes are uttered. The flight of the "Summer Bird" is peculiar; progress is made in an undulating line, the bird rising and falling in regular waves. As it reaches the top of each imaginary wave the wings are folded, the momentum attained carrying it into another wave; the air is then smartly beaten by the wings, which action carries the bird to the top of the next wave, and so on. It is by no means possessed of strong wing power; the flight can at no time be called rapid.

Coming to the family *Muscicapidæ*, several species claim more than a passing notice. First we have the Dusky Fantail (*Rhipidura diemenensis*); this interesting little species differs from the mainland *R. albirostris* in several points. In addition to this island, it is found on several of the neighbouring islands in Bass Strait. To most people it is familiar either under the name of "Cranky Fan," or "Crazy Fantail." It is fairly evenly distributed throughout the island; in open plain country and places where there are no creeks and rivers, however, it is rare, if not altogether absent. The nest of the genus *Rhipidura* is too well-known for me to describe that of this species. In some specimens I have found, the curious tail-like appendage has been very well developed. The food of the Dusky Fantail consists almost entirely of insects, which are largely captured in the air. When

flitting from bough to bough it has a rather head-over-heels kind of flight; it is from this curious habit that it gains the name of "Cranky Fan." It is very tame in disposition, and has often been known to enter dwellings in the bush and amuse itself catching flies on the window-panes. Although preferring the vicinity of creeks and shady dells, it is no uncommon object in the gardens round and about Launceston. The bump of curiosity seems to be largely developed in this species; oftentimes have I had one or more flitting round my head and face when standing observing their habits in the bush. The flight is weak and wavering, many strange antics being performed when on the wing. The song is also weak, but pretty: I always enjoy sitting in some thickly wooded gully and listening to the Dusky Fantail pouring forth its notes to the accompaniment of a babbling rill. During the breeding season it goes about in pairs, at other times singly.

Another species of this family also worth consideration is the Long-tailed Blue Wren (*Malurus gouldi*), an insular form of the mainland *M. cyaneus*, from which it differs in being slightly larger in build, and its blue of a slightly deeper shade. Besides this island, it is found on the Furneaux group in Bass Strait. Under various names, such as "Gould's Blue Wren," "Cocktail," "Blue Cap," &c., is this beautiful little species known. It is well distributed over the greater part of Tasmania, being in some districts very plentiful. The male bird is a very amusing little fellow; the airs and graces he assumes are worth watching; he hops round with his long tail erect as though he were a very important personage, as no doubt he is in his own estimation. Along and over fallen logs he proceeds, darting suddenly to the ground when something choice catches his eye, back again on to the logs, now perching on a stump to pour out his little song, then once more all on the alert, darting after some fly, and poking his little beak into every crack and crevice, flitting his tail the while; so on he goes the live-long day, tireless in his inquisitiveness.

The Blue Wren (*M. cyaneus*) of the mainland is said to be a polygamist; so, to a certain extent, is our Blue Wren. I have often been much struck by the fact that a male often has two, and sometimes three, females following meekly after him, picking up scraps he does not consider good enough for his own lordly

little stomach. I am not altogether satisfied with this polygamous record; it is a subject that requires long and close attention, at all seasons of the year and under varying circumstances, before a really definite conclusion can be arrived at. My opinion on the subject is not as pronounced as it was a few years since; lengthened observations have somewhat modified my views. Round bush homesteads the Blue Wren becomes very tame, hopping round the doorways, and even into the passages, in search of food. When in the scrub it prefers to use its legs when moving from place to place. Its powers of running are very great, it is as nimble as a mouse; in fact, it has the appearance of one when seen a few yards off, as it scurries under and over the fallen timber. The powers of flight are rather feeble, and only resorted to when moving from one locality to another, or when suddenly frightened; it prefers to trust to its legs. The song is weak, but is a rather pleasing run of notes, uttered usually when perched on some eminence.

The Dark-blue Wren (*M. elizabethæ*) was, as Mr. A. J. Campbell tells us,* procured on King Island during the visit of the Victorian Field Naturalists' Club in 1887. At first this species was thought to be *M. gouldi*, but a subsequent examination of a long series of skins of this and other species of Wrens, "from Tasmania to the tropics," showed the King Island bird to be a good species. Mr. Campbell says †:—"The characteristics of the King Island bird are that it is the largest of all, and has a decidedly darker shade of blue—brilliant ultramarine being the nearest colour. The tail is dark-blue, while there is quite a wash of blue on the buffy white under-surface below the band of velvety black, and on the outer edge of some of the primaries. The female is similar to *M. cyaneus*, but is much larger and slightly darker brown in colour, with a slight bluish tinge in the feathers of the tail."

The species is reported as being common on the island. I am rather inclined to think that, as our knowledge of the Australian ornis extends, the three species—viz. *M. cyaneus*, *M. gouldi*, and *M. elizabethæ*—will have to be grouped under one specific name, and that *cyaneus*.

* 'Nests and Eggs of Australian Birds,' p. 1077.

† *Loc. cit.*

Putting on one side the size of *M. elizabethæ*, there is very little to distinguish it from either of the other two species. There is always a certain amount of charm about insular varieties, so that the attempt, when it comes, to lump these three species as one will be sure to meet with opposition. Having in view the advances that Australian ornithology is making, I feel sure the day is not far distant when we shall see not only the species under discussion severely dealt with, but also several other cherished insular forms treated in a similar manner.

The subfamily *Turdinæ*, containing the Large-billed Ground Thrush (*Geocichla macrorhyncha*), comes next under review. This handsome Thrush, which is but an insular variety of *G. lunulata* of the mainland, is found, in addition to Tasmania, on several of the neighbouring islands. Gould hesitated some time before deciding to treat *G. macrorhyncha* as a distinct species. The Tasmanian species is somewhat more bulky, and has a stouter bill than its mainland cousin; it is fairly well distributed throughout the island, well-wooded and moist gullies being its favourite haunts. As may be expected, insects and seeds constitute the diet of the species; the insects are almost entirely procured from out of the ground, and from among fallen leaves and twigs. This Thrush seldom employs its wings, which are not really strong, but trusts rather to its legs; the rapidity with which it can move from place to place is really astonishing. Being much of the colour of the soil, it is difficult in the gathering gloom to follow its movements with accuracy. The note is a very pretty low whistle, to be heard issuing from the scrub early in the morning while the grass and leaves are yet wet with dew; also at dusk.

The group *Acanthizinaæ*, of the subfamily *Timeliinaæ*, contains no fewer than five species worthy of consideration. The Tasmanian Tit, or Brown Tail (*Acanthiza diemenensis*), is found on some of the Bass Strait Islands in addition to Tasmania. The species is very plentiful in some parts of this island; it moves in flocks varying in number from ten to thirty, if not more. Open forest country is its favourite haunt, where it moves from tree to tree with quick eager movements as it searches out the insects on the leaves and under the bark. Occasionally I have disturbed a flock feeding close to the ground

among fallen scrub. One of its vernacular names is "Badger Bird"—why, I know not.

Ewing's Tit (*A. ewingi*), which was figured by Gould, had been lost sight of until Mr. A. G. Campbell rediscovered it on King Island in November, 1902; he also procured a specimen in the gullies on Mount Wellington, near Hobart, in November, 1908. Col. Legge informs us that a specimen was found in a small collection recently acquired by the Hobart Museum from the New Norfolk district. Now that the species has had its identity placed beyond dispute, it remains for field naturalists to ascertain its range in this island. It is distinguished from *A. diemenensis* chiefly by the dark "winglet," rufous forehead, greater length of tail, and longer tarsus. It is also darker on the upper surface, throat, and abdomen.

The Long-billed Tit (*A. magnirostris*) was also discovered by Mr. A. G. Campbell during his trip to King Island in November, 1902. This species, as Mr. A. J. Campbell tells us, has more of the black and white mottled under-surface than *A. diemenensis*; it is also remarkable for the great size of its bill.

The Scrub Tit (*Acanthornis magna*) is confined to Tasmania alone, where it is found in the neighbourhood of Mount Wellington, and is also reported to be not uncommon round Mount Bischoff. In some other and similar localities it is also found, but in no district is it at all common. Placed originally among the *Acanthizæ*, it was transferred to the genus *Sericornis*, but Col. Legge has founded a new genus for its reception, viz. *Acanthornis*.

In addition to Tasmania, the Brown Scrub Wren (*Sericornis humilis*) is found on some of the adjacent islands. The species is more plentiful than the one just referred to. It also frequents more open and accessible country, though it is very fond of tracts with an abundance of undergrowth, where it procures its food and rears its young. It is a fast runner, and somewhat shy, so that it is with difficulty that one obtains a good view of it in the scrub. Some few months since I was fortunate enough to see six or eight birds of this species searching for insects among the grass and leaves and small bushes in a partly cleared patch. It was necessary for me to

remain very still; after watching them for a while, I made a slight movement, when they all scurried off into the scrub.

Passing to the family *Laniidæ*, the Lesser White-backed Magpie (*Gymnorhina hyperleuca*) well merits a note. It is confined solely to Tasmania, where it is very common in some parts, but altogether wanting in others. The northern and agricultural districts are its strongholds. To Tasmania belongs the privilege of being the first Australasian State to recognize the Magpie as being of economic value, and to extend protection to it as such. In 1879, under the Game Protection Act, 42 Vict., No. 24, it was decreed that whosoever killed the birds or destroyed their eggs would be liable to a penalty not exceeding £1. In 1885 this Act was extended under 48 Vict., No. 35, so that persons could not buy, sell, or offer for sale birds of this species. Notwithstanding this, large numbers of young birds are taken annually and sold in the towns. When not engaged in seeking food, most of its time is spent among the branches of lofty trees. Flocks of from six to a dozen individuals are usually seen; occasionally larger ones may be observed (I have counted as many as forty-seven birds together at one time); round Conara (the native name of the Magpie) and other midland districts even larger flocks are to be seen. It is one of the best, if not the best, feathered friend the farmer has, and is a beautiful songster, its voice being both very powerful and melodious. It is sometimes a strange experience to hear a chorus of Magpies during the middle of a moonlight night.

The Grey Butcher Bird (*Cracticus destructor* subsp. *cinereus*) is closely allied to the mainland *C. destructor*. This species is confined to Tasmania, and is fairly plentiful in parts, especially in the bush round towns and settlements. Its vernacular name is that of "Jackass." Its favoured haunts are thickly timbered tracts, where it can find an abundance of insect and animal life to satisfy its wants. During the winter it may be observed picking scraps of fat off sheep and other skins hanging on farm fences. Like its English cousin, our Butcher Bird often impales its victims on long thorns. One larder I found consisted of two callow nestlings of some small bird, the remains of a Mouse, and a number of large beetles; another consisted of two Sparrows. The notes of the Jackass are hard to describe, being

rather "a jumble of discordant sounds." Nevertheless, the efforts of a number of these birds singing in the early morning are far from being unpleasant. The notes are very loud, and can be heard for some considerable distance.

The White-throated Thickhead (*Pachycephala gutturalis*) is included in my list on the authority of Col. Legge.

Tasmania and some of its neighbouring islands possess a Thickhead—the Grey-tailed Thickhead (*P. glaucura*)—peculiar to their shores. This species is fairly common in well-wooded gullies and hillsides in some parts of the island, from whence its fine whistling notes may be often heard. It is rather shy, and prefers to keep out of sight if it knows it is being watched.

In no list can I find mention of any members of the family *Certhiidae* being found in Tasmania. I have met with both the White-throated Tree-runner (*Climacteris leucophaea*) and the Brown Tree-runner (*C. scandens*) in some of the heavily timbered forests in the north-eastern portion of the island; forests consisting mainly of big timber.

The family *Meliphagidae* contains four species peculiar to this and the adjacent islands. Three species—*viz.* the Strong-billed Honeyeater (*Melithreptus validirostris*), Black-headed Honeyeater (*M. melanocephalus*), and the Yellow-throated Honeyeater (*Ptilotis flavigularis*)—are only worthy of a passing remark. They are all more or less plentiful in those parts of the island where there are plenty of eucalyptus and banksia blossoms for them to feed on. The yellow-throated species obtains a good portion of its food from off the ground.

The Yellow Wattle-Bird (*Acanthochaera inauris*) is confined to this island and King's. Only certain favourable districts are frequented—favourable both as regards food and climate. Altogether the species is very irregularly distributed through the island. It is among the most highly esteemed of our game birds; and it was owing to the great slaughter that had taken place during the past few years, and the fear that the species was in danger of extermination, that it was afforded absolute protection from January 1st, 1902, to May 24th, 1904. Some fairly large bags have been reported this season, which extends from May 24th to July 31st, both inclusive. During the seasons

in which flowering eucalyptus is plentiful, the birds become very fat, and weigh at least six ounces. In the winter its food consists of rich nectar from eucalyptus blossoms and honeysuckle (*banksia*) cones. In summer, as the honeysuckle alone is in flower, insects, especially beetles, are added to its diet. In some districts the eucalyptus blossoms one year, and in another district the next; the consequence is that the Wattle Bird moves from one district to another in search of food. I have found it to be very plentiful one season, and the next hardly a bird was to be seen or heard. In summer it resorts to the mountain-slopes, returning to the plains as winter approaches; the harder the winter frosts, the more plentiful is the bird expected to be; the thickly-wooded plains are warmer than the mountain-sides. It soon becomes very wild after being shot at, and is difficult to approach, giving the alarm and taking flight at the least sign of danger. It moves in flocks, which vary greatly in number. I do not know whether, as a rule, the Wattle Bird sleeps at its feeding-ground, but at the first glimmer of daylight it can be heard among the tree-tops. I have watched large flocks leaving their feeding-ground at dusk, and moving further into the bush. The voice of this species is very remarkable, and, once heard, is not likely to be easily forgotten or mistaken for that of any other species. The cry is loud and harsh, and is between a cough and a scolding voice suffering from a cold in the throat.

In the family *Dicaeidae*, the Forty-spotted Pardalote (*Pardalotus quadragintus*) is peculiar to both Tasmania and King Island. This tiny Pardalote is only met with in certain parts of the island; it spends most of its time among the tops of lofty forest trees, principally in gullies. The colour of its plumage approximates so closely to that of the foliage among which it spends most of its time, that it is but rarely seen, unless specially searched for. It usually moves in small bands of from four to a dozen individuals.

The White-rumped Swift (*Micropus pacificus*), family *Cypselidæ*, is only an occasional visitor, sometimes accompanying bands of Spine-tailed Swifts (*Chætura caudacuta*) on their brief visits to our shores.

The Black Cockatoo (*Calyptrorhynchus funereus*) is looked

upon by many bush-dwellers as a sure weather prophet, for they say that when it is going to be stormy the Black Cockatoo flies very low, and is exceedingly noisy. I have noticed the same thing myself. A belt of rung timber presents a very curious appearance after a flock of these birds has passed through. The bark hangs from every tree in long strips as it was torn off by the powerful bills of the birds in search of grubs. The White Cockatoo (*Cacatua galerita*) is very plentiful in some districts, and is very destructive to sprouting grain.

The Greater Brown Quail (*Synæcus diemenensis*), of the family *Phasianidæ*, is not considered by the British Museum authorities to be a good species, but I can assure those gentlemen that all field naturalists and observant sportsmen are quite convinced of its validity. It is larger and much more handsomely marked than the ordinary Brown or Swamp Quail; there is also a marked difference in the eggs of the two birds.

Of the Plovers, the Black-breasted (*Zonifer tricolor*) is the most plentiful. The fine Spur-wing (*Lobivanellus lobatus*) is confined to a more restricted area. Both the Grey (*Squatarola helvetica*) and the Lesser Golden (*Charadrius dominicus*) are met with in the midland districts fairly plentifully.

I will leave the review of the aquatic species until some future date, as my paper has already become of inordinate length. I have tried to give a little interesting information about some of the species found in this, the "Emerald Isle" of the south; but there are others, although not "peculiar," about which I would have liked to have spoken.

The subjoined list of birds found in, and about the shores of, Tasmania and its dependencies is, to the best of my ability, a full and correct one. As I have elsewhere indicated, the list will doubtless require modifying and extending as we become better acquainted with many species about which there exists uncertainty and doubt:—

ACCIPITRES.

Circus assimilis, Jard. & Selby (Spotted Harrier). *C. gouldi*, Bonap. (Harrier or Swamp-Hawk). *Astur novæ-hollandiæ*, Gmelin (White Gos-Hawk). *A. approximans*, Vigors & Horsf. (Gos-Hawk). *Accipiter cirrhocephalus*, Vieill. (Sparrow-Hawk). *Uroaëtus audax*, Lath. (Wedge-tailed Eagle). *Haliaëtus leucogaster*, Gmelin (White-bellied Sea Eagle).

Falco melanogenys, Gould (Black-cheeked Falcon). *F. lunulatus*, Lath. (Little Falcon). *Hieracidea orientalis*, Schlegel (Brown Hawk). *Cerchneis cenchroides*, Vig. & Horsf. (Nankeen Kestrel). *Pandion haliaëtus* subsp. *leucocephalus*, Gould (White-headed Osprey). *Ninox boobook*, Lath. (Boobook Owl) (doubtful). *N. maculata*, Vig. & Horsf. (Spotted Owl). *Strix nova-hollandiæ* subsp. *castanops*, Gould (Chestnut-faced Owl).

PASSERES.

Corvus coronoides, Vig. & Horsf. (Crow). *Corone australis*, Gould (Raven). *Strepera arguta*, Gould (Hill Crow Shrike). *S. fuliginosa*, Gould (Sooty or Black Crow-Shrike). *Chibia bracteata*, Gould (Drongo) (accidental). *Grallina picata*, Lath. (Magpie Lark) (accidental). *Collyriocinclæ rectirostris*, Jard. & Selby (Whistling Shrike-Thrush). *Graucalus melanops* subsp. *parvirostris*, Gould (Small-billed Cuckoo-Shrike). *Lalage tricolor*, Swains. (White-shouldered Caterpillar-eater) (accidental). *Rhipidura diemenensis*, Sharpe (Dusky Fantail). *Myiagra rubecula*, Lath. (Leaden-coloured Flycatcher). *M. nitida*, Gould (Satin Flycatcher). *Petræa leggi*, Sharpe (Scarlet-breasted Robin). *P. phænicea*, Gould (Flame-breasted Robin). *P. rhodinogastra*, Drapier (Pink-breasted Robin). *Amaurodryas (Petræa) vittata*, Quoy & Gaim. (Dusky Robin). *Malurus gouldi*, Sharpe (Long-tailed Blue Wren). *M. elizabethæ*, Campbell (Dark-blue Wren). *Acrocephalus australis*, Gould (Reed Warbler). *Geocichla macrorhyncha*, Gould (Large-billed Ground-Thrush). *Ephthianura albifrons*, Jard. & Selby (White-fronted Chat). *Stipiturus malachurus*, Lath. (Emu Wren). *Megalurus gramineus*, Gould (Grass-Bird). *Acanthiza diemenensis*, Gould (Tasmanian Tit, Brown Tail). *A. ewingi*, Gould (Ewing's Tit). *A. magnirostris*, Campbell (Large-billed Tit). *A. chrysorrhoa*, Quoy & Gaim. (Yellow-rumped Tit). *Acanthornis magna*, Gould (Scrub Tit). *Sericornis humilis*, Gould (Brown Scrub-Wren). *Cinclosoma punctatum*, Lath. (Spotted Ground Bird). *Calamanthus fuliginosus*, Vig. & Horsf. (Striated Field-Wren). *Gymnorhina hyperieuca*, Gould (Lesser White-backed Magpie). *Craicticus destructor*, Temm., subsp. *cinereus*, Gould (Grey Butcher Bird). *Pachycephala olivacea*, Vig. & Horsf. (Olive Thickhead). *P. gutturalis*, Lath. (White-throated Thickhead) (doubtful). *P. glaucura*, Gould (Grey-tailed Thickhead). *Climacteris leucophæa*, Lath. (White-throated Tree-runner). *C. scandens*, Temm. (Brown Tree-runner). *Zosterops ceruleascens*, Lath. (White-eye). *Acanthorhynchus tenuirostris*, Lath. (Spine-bill). *Melithreptus validirostris*, Gould (Strong-billed Honeyeater). *M. melanocephalus*, Gould (Black-headed Honeyeater). *Glycyphila fulvifrons*, Lewin (Fulvous-fronted Honeyeater). *Ptilotis flavigularis*, Gould (Yellow-throated Honeyeater). *Meliornis australasiana*, Shaw (Crescent

Honeyeater). *M. nova-hollandia*, Lath. (White-bearded Honeyeater). *Manorhina garrula*, Lath. (Garrulous Honeyeater). *Acanthochara inauris*, Gould (Yellow Wattle-Bird). *A. mellivora*, Lath. (Brush Wattle-Bird). *Pardalotus affinis*, Gould (Yellow-tipped Pardalote). *P. punctatus*, Temm. (Spotted Pardalote). *P. quadragintus*, Gould (Forty-spotted Pardalote). *Hirundo neoxena*, Gould (Welcome Swallow). *Petrochelidon nigricans*, Vieill. (Tree Martin). *P. ariel*, Gould (Fairy Martin). *Anthus australis*, Vig. & Horsf. (Ground Lark or Pipit). *Artamus sordidus*, Lath. (Wood-Swallow). *Zonaginus bellus*, Lath. (Fire-tailed Finch).

PICARIDÆ.

Micropus pacificus, Lath. (White-rumped Swift) (occasional visitor). *Chætura caudacuta*, Lath. (Spine-tailed Swift). *Podargus strigoides*, Lath. (Tawny Frogmouth, Morepork). *Ægotheles nova-hollandia*, Lath. (Little Nightjar). *Alcyon azurea*, Lath. (Blue Kingfisher). *Halcyon sanctus*, Vig. & Horsf. (Sacred Kingfisher). *Cuculus pallidus*, Lath. (Pallid Cuckoo). *C. flabelliformis*, Lath. (Fantailed Cuckoo). *Chalcococcyx plagosus*, Lath. (Bronze Cuckoo). *C. basalis*, Horsf. (Narrow-billed Bronze Cuckoo). *C. lucidus*, Lath. (Broad-billed Bronze Cuckoo). *Scythrops nova-hollandia*, Lath. (Channel-bill Cuckoo) (accidental).

PSITTACI.

Trichoglossus nova-hollandia, Gmelin (Blue-bellied Lorikeet). *Glossopsittacus concinnus*, Shaw (Musk Lorikeet). *G. pusillus*, Shaw (Little Lorikeet). *Calyptorhynchus funereus*, Shaw (Black Cockatoo). *Callocephalon galeatum*, Lath. (Gang-gang Cockatoo). *Cacatua galerita*, Lath. (White Cockatoo). *Platycercus flaviventris*, Temm. (Green Parrakeet). *P. eximius*, Shaw (Rosella). *Neophema venusta*, Temm. (Blue-banded Grass-Parrakeet). *N. chrysogastra*, Lath. (Yellow-bellied Grass-Parrakeet). *Nanodes discolor*, Shaw (Swift Parrakeet). *Pezoporus formosus*, Lath. (Ground Parrakeet).

COLUMBÆ.

Ptilopus superbus, Temm. (Purple-crowned Fruit-Pigeon) (accidental). *Lopholamys antarcticus*, Shaw (Top-knot Pigeon) (accidental). *Phaps chalcoptera*, Lath. (Bronze-wing Pigeon). *P. elegans*, Temm. (Brush Bronze-wing Pigeon).

GALLINÆ.

Coturnix pectoralis, Gould (Stubble Quail). *Synæcus diemenensis*, Gould (Greater Brown Quail). *S. australis*, Temm. (Brown Quail).

HEMIPODII.

Turnix varia, Lath. (Painted Quail).

FULICARIÆ.

Hypotaenidia brachypus, Swains. (Slate-breasted (Lewins') Rail). *H. philippinensis*, Linn. (Pectoral Rail). *Porzana fluminea*, Gould (Spotted Crake). *P. palustris*, Gould (Little Crake). *P. tabuensis*, Gmelin (Spotless Crake). *Tribonyx mortieri*, Du Bus. (Native Hen). *Porphyrio melanonotus*, Temm. (Bald Coot). *Fulica australis*, Gould (Coot).

LIMICOLÆ.

Burhinus (Edicnemus) grallarius, Lath. (Stone Plover). *Arenaria interpres*, Linn. (Turnstone). *Hematopus longirostris*, Vieill. (Pied Oystercatcher). *H. unicolor*, Wagler (Black Oystercatcher). *Lobivanellus lobatus*, Lath. (Spur-winged Plover). *Zonifer tricolor*, Vieill. (Black-breasted Plover). *Squatarola helvetica*, Linn. (Grey Plover). *Charadrius dominicus*, Muller (Lesser Golden Plover). *Ochthodromus (Ægialitis) bicinctus*, Jard. & Selby (Double-banded Dottrel). *Ægialitis ruficapilla*, Temm. (Red-capped Dottrel). *Æ. melanops*, Vieill. (Black-fronted Dottrel) (accidental). *Æ. cucullata*, Vieill. (Hooded Dottrel). *Himantopus leucocephalus*, Gould (White-headed Stilt). *Cladorhynchus pectoralis*, Du Bus. (Banded Stilt). *Recurvirostra novaehollandiæ*, Vieill. (Red-necked Avocet). *Numenius cyanopus*, Vieill. (Australian Curlew). *N. phaeopus* subsp. *variegata*, Salvad. (Whimbrel). *Limosa nova-zealandiæ*, Gray (Barred-rumped Godwit). *Tringoides hypoleucus*, Linn. (Common Sandpiper). *Glottis nebularius*, Gunner. (Greenshank). *Limonites ruficollis*, Pallas (Little Stint). *Heteropygia acuminata*, Horsf. (Marsh Stint). *Ancylochilus subarcuatus*, Gmel. (Curlew Stint). *Gallinago australis*, Lath. (Australian Snipe).

GAVIÆ.

Sterna (Hydroprogne) caspia, Pallas (Caspian Tern). *S. polioerca*, Gould (Bass Strait Tern). *S. frontalis*, Gray (White-fronted Tern). *S. neries*, Gould (White-faced Tern). *S. anæstha*, Scop. (Brown-winged (Panayan) Tern) (doubtful). *S. fuliginosa*, Gmelin (Sooty Tern) (doubtful). *Larus novaehollandiæ*, Steph. (Silver Gull). *Larus (Gabianus) pacificus*, Lath. (Pacific Gull). *Megalestris antarctica*, Less. (Antarctic Skua). *Stercorarius crepidatus*, Banks (Richardson's Skua).

TUBINARES.

Oceanites oceanicus, Kuhl. (Yellow-webbed Storm-Petrel). *Garrodis nereis*, Gould (Grey-backed Storm-Petrel). *Pelagodroma marina*, Lath.

(White-faced Storm-Petrel). *Cymodroma melanogaster*, Gould (Black-bellied Storm-Petrel). *C. grallaria*, Vieill. (White-bellied Storm-Petrel). *Puffinus chlororhynchus*, Lesson (Wedge-tailed Petrel). *P. assimilis*, Gould (Allied Petrel). *P. carneipes*, Gould (Fleshy-footed Petrel) (doubtful). *P. tenuirostris*, Temm. (Short-tailed Petrel, Mutton Bird). *P. gavia*, Forster (Forster Petrel) (doubtful). *Profinus cinereus*, Gmelin (Grey (Brown) Petrel). *Priocella glacialis*, Smith (Silver-grey Petrel). *Majaqueus parkinsoni*, Gray (Black Petrel). *Estrelata macroptera*, Smith (Great-winged Petrel). *E. lessoni*, Garnot (White-headed Petrel). *E. mollis*, Gould (Soft-plumaged Petrel). *E. solandri*, Gould (Brown-headed Petrel). *E. leucoptera*, Gould (White-winged Petrel). *Ossifraga gigantea*, Gmelin (Giant Petrel). *Daption capensis*, Linn. (Cape Petrel). *Halobæna cærulea*, Gmelin (Blue Petrel). *Prion desolatus*, Gmel. (Dove Prion). *P. ariel*, Gould (Fairy Prion). *P. banksi*, Smith (Banks' Prion). *P. vittatus*, Illiger (Broad-billed Prion). *Pelecanoides urinatrix*, Gmel. (Diving Petrel). *Diomedea exulans*, Linn. (Wandering Albatross). *D. melanophrys*, Temm. (Black-browed Albatross). *Thalassogeron cautus*, Gould (White-capped Albatross). *T. culminatus*, Gould (Flat-billed Albatross). *T. chlororhynchus*, Gmel. (Green-billed Albatross). *Phæbetria fuliginosa*, Gmel. (Sooty Albatross).

PLATALEÆ.

Carphibis spinicollis, Jameson (Straw-necked Ibis) (accidental). *Plegadis falcinellus*, Linn. (Glossy Ibis).

HERODIONES.

Notophox pacifica, Lath. (Pacific Heron). *N. novæ-hollandiæ*, Lath. (White-fronted Heron). *Demigretta sacra*, Gmelin (Reef Heron). *Herodias timoriensis*, Lesson (White Egret). *Nycticorax caledonicus*, Gmel. (Night Heron). *Botaurus pæciloptilus*, Wagler (Bittern).

STEGANOPODES.

Phalacrocorax carbo, Linn. (Black Cormorant). *P. sulcirostris*, Brandt (Little Black Cormorant). *P. gouldi*, Salv. (White-breasted Cormorant). *P. melanoleucus*, Vieill. (Little Cormorant). *Sula serrator*, Banks (Australian Gannet). *Pelecanus conspicillatus*, Temm. (Pelican).

PYGOPODES.

Podiceps novæ-hollandiæ, Steph. (Black-throated (Little) Grebe). *P. nestor*, Gould (Hoary-headed Grebe). *P. cristatus*, Linn. (Tippet Grebe).

IMPENNES.

Catarrhactes chrysocome, Forst. (Crested Penguin). *Eudyptula minor*, Forst. (Little Penguin). *E. undina*, Gould (Fairy Penguin).

CHENOMORPHÆ.

Chenopsis atrata, Lath. (Black Swan). *Anseranas semipalmata*, Lath. (Pied Goose). *Cereopsis nova-hollandia*, Lath. (Cape Barren Goose). *Chenonetta jubata*, Lath. (Wood Duck) (accidental). *Dendrocygna eytoni*, Gould (Eyton's Tree Duck). *Casarca tadernoides*, Jard. (Shieldrake or Mountain Duck). *Anas superciliosa*, Gmelin. (Black Duck). *Nettion castaneum*, Eyton (Teal). *N. gibberifrons*, Muller (Grey Teal). *Spatula rhynchotis*, Lath. (Shoveler). *Malacorhynchus membranaceus*, Lath. (Pink-eared Duck, Wigeon). *Stictonetta nivosus*, Gould (Freckled Duck) (accidental). *Nyroca australis*, Gould (White-eyed Duck, Hardhead). *Erismatura australis*, Gould (Blue-billed Duck). *Biziura lobata*, Shaw (Musk Duck).

BIRD-LIFE IN JERSEY.

By Sergeant H. MACKAY, 2nd H.L.I.

THE fascinating study of the lives of birds, their mysterious migratory movements and marvellous obedience to that peculiar instinct which compels certain species to wander from one country to another as the seasons of the year demand, is a never-failing source of interest to the ornithological student. I have, however, no desire at the present time to discuss that strange law by which the movements of birds are governed, but merely to submit the result of observations on the feathered inhabitants of Jersey, both resident and migratory.

Apart from my own personal observations, I am indebted to several gentlemen who have very kindly permitted me to examine their collections of Jersey-taken specimens, and especially to Mr. Caplin and Mr. Romeril, the latter a life-long and thoroughly reliable observer of bird-life, whose collection consists of specimens procured personally, and skilfully mounted by his own hands.

As I have seen but little mention of the Channel Islands in any ornithological work that I have had access to,* I thought the compilation of a list of specimens obtained in Jersey might possibly prove of some small service to those interested in this subject.

I may further add that all observations have been conducted in a manner calculated to ensure complete and accurate information of the various species referred to.

MISTLE-THRUSH (*Turdus viscivorus*).—Common throughout the island, more plentiful during the winter months.

SONG-THRUSH (*T. musicus*).—Common all over the island.

REDWING (*T. iliacus*).—Plentiful during the winter months.

FIELDFARE (*T. pilaris*).—A regular winter visitor, but not so numerous as the foregoing species.

* Cf. Gordon Dalglish, "Ornithological Notes from Guernsey" (Zool. 1908, pp. 281 and 277).—Ed.

BLACKBIRD (*T. merula*).—Common.

RING-OUZEL (*T. torquatus*).—This species is occasionally obtained here, but principally during the months of September and October, the usual period of its migration southwards. The last recorded specimen was taken on Oct. 8th, 1900.

WHEATEAR (*Saxicola cenanthe*).—Plentiful during the summer months.

STONECHAT (*Pratincola rubicola*).—Common everywhere, especially around Fort Regent and the vicinity.

REDSTART (*Ruticilla phœnicurus*).—Scarce. Observed a male specimen close to Fort Regent on Feb. 1st, 1904.

BLACK REDSTART (*R. titys*).—This species is also scarce. Saw a female specimen on the roadway leading to the Fort, April 4th, 1903. Mr. Romeril informs me that these birds occur but rarely in Jersey, he having only seen a few at long intervals during many years of observation.

REDBREAST (*Erithacus rubecula*).—Fairly common throughout the island.

WHITETHROAT (*Sylvia cinerea*).—Common.

GOLDEN-CRESTED WREN (*Regulus cristatus*).—Obtained occasionally on migration.

FIRE-CRESTED WREN (*R. ignicapillus*).—Mr. Romeril informs me that this species is more plentiful than the foregoing during the winter months.

HEDGE-SPARROW (*Accentor modularis*).—Common.

GREAT TIT (*Parus major*).—Sparsely distributed throughout the island.

BLUE TIT (*P. cæruleus*).—More plentiful than the foregoing.

WREN (*Troglodytes parvulus*).—Fairly common. While on my way to the Fort on the morning of Oct. 26th, 1903, I observed large numbers of Wrens in the hedges around South Hill. I counted no fewer than eleven birds on one isolated bush, while considerable numbers were twittering and fluttering about the bottom of the hedges in a most excited manner. I have never at any time seen so many Wrens together, and can only account for their appearance at that time as due to passing migration. On the following day they had all disappeared.

PIED WAGTAIL (*Motacilla lugubris*).—Saw two of this species

near South Hill on May 14th, 1903. These are the only specimens I have seen.

GREY WAGTAIL (*M. melanope*).—Observed two examples on the barrack square at Fort Regent on Oct. 29th, 1903, and have since seen several specimens moving about the shallow stream which runs through the Valley de Veaux.

MEADOW-PIBIT (*Anthus pratensis*).—Common everywhere throughout the island. Many birds feed on the barrack square and grassy ramparts of the Fort.

TREE-PIBIT (*A. trivialis*).—Have observed several specimens around the Fort during the summer months.

GREAT GREY SHRIKE (*Lanius excubitor*).—Not uncommon during the winter months.

RED-BACKED SHRIKE (*L. collurio*).—Fairly common throughout the island, nesting in suitable localities.

PIED FLYCATCHER (*Muscicapa atricapilla*).—Fairly common during the summer, and nests on the island.

SWALLOW, MARTIN, SAND-MARTIN, and SWIFT.—All common during summer, particularly the Swift.

GREENFINCH (*Ligurinus chloris*).—Common everywhere throughout the island.

HAWFINCH (*Coccothraustes vulgaris*).—Only a few specimens are on record as having been obtained in Jersey. Mr. Caplin and Mr. Romeril each have specimens in their collections.

GOLDFINCH (*Carduelis elegans*).—This species is not so much in evidence as in former years, and is evidently decreasing. Its market value as a cage-pet is, and always will be, accountable for its decrease everywhere. A pair nested and reared their young on a plum-tree in a garden below Fort Regent this year.

HOUSE-SPARROW (*Passer domesticus*).—Common.

CHAFFINCH (*Fringilla cœlebs*).—Fairly common throughout the island.

BRAMBLE-FINCH (*F. montifringilla*).—This species is occasionally obtained during the winter months, principally when severe weather prevails in the north.

LINNET (*Linota cannabina*).—Common. Large numbers nest in suitable situations around the Fort.

BULLFINCH (*Pyrrhula europæa*).—Saw one specimen on a tree in a corner of Fort Regent, March 3rd, 1903. This is the only

one I have observed, and I am informed it occurs but rarely on the island.

CROSSBILL (*Loxia curvirostra*).—This species has occasionally been obtained on migration.

YELLOW BUNTING (*Emberiza citrinella*). — Fairly common throughout the island.

SNOW-BUNTING (*Plectrophenax nivalis*).—According to records produced by Mr. Caplin and Mr. Romeril, this species has only been obtained in very severe winters. The last two specimens recorded were obtained on Oct. 25th, 1900.

STARLING (*Sturnus vulgaris*).—Common. Eighteen or twenty years ago Starlings were comparatively rare in Jersey, but since then they have gradually increased to abundancy. This increase has been general almost all over the British Isles.

JAY (*Garrulus glandarius*). — Fairly common in the more wooded parts of the island. A fine male example was forwarded to me from St. Peter's Valley for preservation in January this year.

MAGPIE (*Pica rustica*).— This species, locally named the "Jersey Pheasant," on account of its long tail, is one of the commonest birds on the island.

CARRION-CROW (*Corvus corone*).—Common.

HOODED CROW (*C. cornix*).— This species is by no means common, and usually arrives in October, about the same time as the Woodcock.

ROOK (*C. frugilegus*).—Common.

SKY-LARK (*Alauda arvensis*).—Abundant everywhere on the island.

NIGHTJAR (*Caprimulgus europæus*).— Fairly common during the summer months. A specimen shown to me was obtained as late as Nov. 25th, 1908.

KINGFISHER (*Alcedo ispida*).—Sparsely distributed throughout the island. Observed two specimens near the diving-stage at La Collette, Nov. 14th, 1908.

BEE-EATER (*Merops apiaster*).— Only two specimens taken here are on record, the last being obtained during the summer of 1892.

HOOPOE (*Upupa epops*). — Mr. Romeril has in his possession a Hoopoe, shot on his farm thirty years ago; since then—

up till November, 1903, when he observed a bird in a field near Gorey—he had not seen a single specimen. Mr. Caplin, however, informs me that very few seasons pass without a specimen or more being recorded, and kindly gave me the dates of the last three examples taken—April, 1900, 1902, 1903. This year Mr. Caplin has had two specimens—one taken on April 16th, and another on May 21st.

CUCKOO (*Cuculus canorus*).—Common during the summer. The Cuckoos were quite as numerous around the Fort this year as they were last season, but for some reason or other have been remarkably silent this year. Throughout the whole of May and June, and part of July, 1903, its familiar call was heard daily in the vicinity of Fort Regent, but this summer it has been very seldom heard, although birds are plentiful. Perhaps the cold north-east winds and unfavourable weather during May and the early part of June may possibly account for its protracted silence. There was much discussion some years ago in 'The Zoologist' with regard to the Cuckoo calling on the wing, some writers averring that such was of rare occurrence. It is many years ago since I first heard the Cuckoo utter its familiar call during flight, and here in Jersey it is commonly observed as the bird crosses the Fort, or flies from one tree to another.

LONG-EARED OWL (*Asio otus*).—Sparsely distributed throughout the island, and usually obtained during the winter months.

SHORT-EARED OWL (*A. accipitrinus*).—Obtained chiefly in winter, and much scarcer than the former species.

MARSH-HARRIER (*Circus æruginosus*).—Mr. Romeril has a fine male specimen of the Marsh-Harrier in his possession, which was obtained on his farm about 1874, and is the only recorded specimen taken in Jersey.

COMMON BUZZARD (*Buteo vulgaris*).—This species is met with occasionally, both Mr. Caplin and Mr. Romeril having specimens in their collections.

SPARROW-HAWK (*Accipiter nisus*).—Fairly common. Nesting in suitable localities.

PEREGRINE FALCON (*Falco peregrinus*).—This handsome species of the Hawk family has been obtained frequently in Guernsey, although but few are recorded in Jersey. A fine male specimen was taken in Guernsey on Dec. 26th, 1903.

MERLIN (*F. æsalon*).—Sparsely distributed over the island. I had a female specimen sent me for preservation on Oct. 21st, 1903.

KESTREL (*F. tinnunculus*). — Fairly common. Nesting in suitable situations.

Albino Kestrel.—Mr. Romeril has a white specimen of the Kestrel in his collection, which was obtained by him some years ago. It is pure white with the exception of about half a dozen buffish-coloured feathers sprinkled over the back and wings.

COMMON HERON (*Ardea cinerea*).—This species wanders occasionally to the Channel Isles, two or three birds being usually obtained during the winter months.

COMMON BITTERN (*Botaurus stellaris*).—Only three of this species are known to have been taken on the island, the last record being December, 1899.

RING-DOVE (*Columba palumbus*). — Fairly common in the wooded parts of the island.

TURTLE-DOVE (*Turtur communis*).— Common in the woods around Grève de Lecq and St. Peter's Valley during the summer.

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

"Elephant Cemeteries."—There has recently been some discussion in the papers relative to the stock of ivory lying at the London Docks, and it has been stated that at least 85 per cent. of the supply is "dead ivory" obtained from "Elephant cemeteries," spots met with here and there in the jungle where Elephants have resorted for centuries to die. Very few of these spots seem to have been discovered by travellers, and scarcely any record is to be found in books of travel. On recently consulting an old work in my possession, 'African Memoranda relative to an Attempt to establish a British Settlement on the Island of Bulama,' &c., by Capt. Philip Beaver, published in 1805, I came across the following passage:—"That district of the Biafara country which is comprised between the river issuing from the Geba Lake (which empties itself into the sea a little below Courbaly to the eastward of Bissao) and the Rio Grande, together with the island of Bulama, abounds with Elephants. The number of these animals on this little island almost exceeds belief; it was nearly impossible for us to proceed fifty yards inland without meeting recent and palpable vestiges of them, and the skeletons of old ones that had died in the woods were frequently found." The writer also proceeded to say that, although these animals frequently swam across that arm of the sea which separates Bulama from the Biafara peninsula, which is about two miles in breadth, none were ever seen attempting to swim back to the continent.—W. L. DISTANT.

Daubenton's Bat (*Myotis daubentoni*) in Middlesex.—One evening last August, as a friend and I were standing on the bridge near Teddington Lock, we observed a number of Bats flying low over the water. I suspected they might be *Myotis daubentoni*, and we resolved to try and "angle" for them. We baited a very small fish-hook with a small piece of tissue-paper; this, being attached to a long piece of cotton, was allowed to float over the bridge a few feet from the surface of the water. In about five minutes we felt a tug, and found a Bat had been caught. This proved to be the above species.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

AVES.

The Marsh-Warbler (*Acrocephalus palustris*) in Oxfordshire: a new Position for the Nest.—I may be allowed to supplement former notes on this subject by a brief statement of my experience of the last two seasons. These birds have never failed to return to their favourite osier-bed, but since it has been cut down every winter, with the exception of a small portion at one end which the owner kindly leaves for the benefit of the birds, I have only succeeded in finding one nest there in each season, instead of the three or more which we found when it was an overgrown jungle. The position of the nest in the osier-bed differs according to the growth of the plants suitable for it; if the meadow-sweet or willow-herb is not sufficiently grown, the birds will hang the nest in the stems of the willows, or even in nettles; this year, however, it was in willow-herb, and in a new spot over a wet ditch—the first time I have known it build in so moist a place. But this is not the new position which I wish to record. For the last two years another pair has taken to a hedge about two hundred yards from the osiers, which separates a corn-field from a hay-meadow adjoining the railway. In 1908 the singing was so persistent in this hedge that I took great pains to find a nest in the nettles and other plants under the hedge, or even in the corn; but I only succeeded in discovering what was plainly an attempt to twist some dry grass-stalks round the stems of two or three beans which were growing among the wheat. Apparently the beans did not answer the purpose, for nothing came of this attempt. This year, however, it was clear that a pair were at work near the same spot, and a nest was begun in meadow-sweet over a ditch at the bottom of the railway embankment, which unluckily again came to nothing, for it was exposed by the cutting of the long grass on the embankment just in front of it before it was more than half finished. The birds then reverted to the hedge; it would have been wiser of them to have taken to the osiers, where they invariably escape all molestation. But they seemed devoted to the same bit of tall hedge which they affected last year, and repeatedly sang in it while I listened sitting just below them; they sang, in fact, nearly all day long, beginning at about four a.m., as the haymakers in the meadow assured me. One morning I went there at five a.m., and after a little watching found a nest almost finished in cow-parsnip and nettles immediately under the hedge, and adjoining the corn. I regret to have to record that at nine a.m. on the same day this nest also was laid bare by someone prowling behind the hedge, and had of course to be abandoned. Even after this second misfortune the cock continued to sing for two

or three days, but by this time it was the last day of June, and I was unable to discover any further attempt to build. Meanwhile the pair in the osiers had safely brought up their young, and Mr. Aplin and I were just in time that same day to find the last young one just about to leave the nest.—W. WARDE FOWLER (Kingham, Chipping Norton).

Early Laying of the Cuckoo (*Cuculus canorus*) in Cheshire.—On the 30th April last I found an egg of this bird, along with one of a Pied Wagtail, in a nest which was built inside an old Blackbird's nest, on a ledge of rock in an old mine working at Alderley Edge. I consider this is an unusually early date for Cheshire. I heard the Cuckoo for the first time this year, at Alderley Edge, on the 26th April.—FRANK S. GRAVES (Ballamoar, Alderley Edge).

The Hobby (*Falco subbuteo*) and its Prey.—The following note on this handsome little Falcon is more in confirmation of a well-known fact than in recording anything new in its interesting habits, but, coming under one's personal observation for the first time, it seemed to possess a peculiar interest. It is with regret I record the death of two of this species in this part of Hants—one in May near Lymington, the other at the end of August near the river here. The former (a male) fell to the gun of a gamekeeper, who stoutly accused it of having destroyed a number of his young Pheasants, but on dissection the stomach of the hawk contained only the remains of insects, mostly Coleoptera, a few Diptera, and a small mass of what appeared to be fur or hair. The August specimen was killed by a man who was waiting at the riverside for the evening flight of Ducks, and the Hobby was doubtless following the Swallows to their roostings amongst the rushes, as it was killed at the same spot as one I recorded in 1892 under somewhat similar circumstances. This was a female in very bright and clean plumage, with no indication of having nested, and a noticeable feature in its appearance was the apparently swollen condition of the neck and throat; this was caused by the entire folded-up *wings* of a Bat, the membranes of which were somewhat torn, but the little stick-like bones were unbroken, the other portions of the Bat having passed into the stomach, where the head, with its sharp little teeth, was very conspicuous amongst the other remains. The stomach also contained a considerable mass of some large insects in an advanced stage of digestion, which my limited knowledge was unable to identify. From what I could make out, the insects had a broad yellow band across the upper portion of the body—something resembling the large sawfly (*Sirex gigas*)—but the body was flatter in shape, without the

yellow tail, and the unmistakable ovipositor of that grand hymenopteron. These insects, whatever they were, might have been swallowed within the body of the Bat, but they appeared to be the remains of a previous meal. Thus it seems the Hobby does not confine itself to one order of insects, although possibly preferring the Coleoptera, as I have seen it chasing members of the Odonata over the forest ponds, a sight not easily forgotten, as it was difficult to tell which was the more expert, the bird or the dragonfly; and the fact of it sometimes taking Bats has been recorded in these pages several times during the past thirty years, indicating that this species is sometimes on the wing later in the day than some of its congeners.—G. B. CORBIN (Ringwood, Hants).

The Stock-Dove in Breconshire.—Although not as numerous as in the English border counties, the Stock-Dove (*Columba oenas*) is here a not uncommon resident. A pair or two nest in most of the woods in the central parts of the county; it is also fond of breeding in the pollard-willows which fringe many of our streams, and in the old oak-trees in the Priory Grove adjoining the town of Brecon. One pair have passed the summer, and probably nested, in a grove of old oaks about a hundred yards from this house, for the last fifteen years at least. In May, 1898, they nested in this grove, in a hole in a tree, in which also a pair of Pied Flycatchers also bred, a distance of about six feet only separating the two nests. In May, 1901, a friend climbed to this same hole, and found a Stock-Dove's nest containing the unusual number of three eggs. In addition to their being rounder, smaller, and creamy, instead of pure white, most of the eggs of this Dove I have seen have another peculiarity which further distinguishes them from those of the Ring-Dove, in that they have a slightly rough shell, caused by little lines of raised surface running spirally across the eggs. Anyone unacquainted with its peculiar note might think it rare here, as it is a shy bird, and, owing to its very rapid flight, it is difficult to identify. The note of the Stock-Dove is but scantily described in our bird-books. It seems to me to resemble the word "woo-oop," repeated about eight times, the last syllable pronounced short and accentuated. This "song," which I often hear from the windows of my house, commences about the middle of March, continuing to about the end of August. It is also occasionally to be heard in the autumn.—E. A. SWAINSON (Woodside, Brecon).

Habits of Willow-Grouse.—In the P. Z. S. 1894, vol. i. pp. 411-12, &c., Dr. Einar Lönnberg tells us the mother of the "Ripoire" or hybrids was a female *Lyrurus tetrix*, and the father a male *Lagopus*

lagopus. Further, that the young hybrids, "when disturbed," perched in trees as the Black-game does, *unlike the Willow-Grouse*; and the italics are his. Does Dr. Einar Lönnberg mean to express that they perched in a different way from what Willow-Grouse do? I have seen scores of Willow-Grouse perch on trees!—J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

The Dotterel in Jersey.—A specimen of the Dotterel (*Eudromias morinellus*) was shot by Sergeant Gale on the bare exposed stretch of common which runs along the coast near Les Landes on Aug. 17th. This species has been rarely obtained in Jersey, and its appearance at this period is accounted for as passing on migration, which usually occurs during August and September. It is a young male bird of the year, the white gorget showing but slightly, the black feathers on the crown of the head being edged with rufous, while the feathers on the back and upper parts are similarly marked. An examination of the gizzard exposed the remains of a green caterpillar, and the black wing-cases of beetles, with a quantity of small granite pebbles. Length, 9 in.; wing, 6 in.; weight, 4½ oz.—H. MACKAY (Jersey).

Peewit Swimming.—On July 21st my brother and I, while standing close to a broad ditch between a barley-field and some meadow-land, saw a young Peewit (*Vanellus vulgaris*) swim across from the field side. We at first took it for a young Duck, of which there were several close by, but the curious shape of the back of the head, caused by the incipient crest, attracted attention. An adult bird of the same species, most likely one of the parents, had for some time been standing about on the meadow near the ditch, keeping probably an anxious watch on the movements of the chick on the other side of the water. On landing the young bird did not at once join its parent, but ran swiftly along the broken-down edge of the ditch, perhaps in search of a suitable place of concealment. That some waders—the Common Sandpiper and Redshank—can both swim and dive is well known, but this is the first time I have seen the Peewit do so.—G. T. ROPE (Blaxhall, Suffolk).

Large Clutch of Eggs in Nest of Lapwing (*Vanellus vulgaris*), and Early Arrival of Turtle-Dove.—Although such large numbers of Lapwings' eggs are taken every spring, I am only aware of two or three instances of more than four eggs in one nest having been recorded. On May 21st last I was fortunate enough to find a clutch of five eggs, one of which I noticed was an abnormally small one, being not much more than half the size of the largest. The usual date of arrival of the Turtle-Dove in this neighbourhood is about May 8rd, but

this year I heard one as early as April 17th, and again on the 24th of the same month ; while on May 28th I found a nest with eggs on the point of hatching.—CHARLES H. BENTHAM (Redhill, Surrey).

Eared Grebe near Lancaster.—On July 28th a fine specimen of the Eared Grebe (*Podiceps nigricollis*) was captured alive on a pond at Middleton, near Lancaster, it being an adult male in full summer plumage. It may be identified from the commoner species—the Slavonian Grebe (*P. auritus*)—by the end of the lower mandible coming up straight instead of being curved, as in the Slavonian species.—H. W. ROBINSON (Lansdowne House, Lancaster).

Bird Slaughter for Feminine Fashion.—I thoroughly agree with every word that Mr. Robert Warren says with regard to bird slaughter for feminine fashion (*ante*, p. 815). Nothing can be more detestable than the wholesale butchery of our most beautiful sea-birds, just at a season when they are performing their most important duties of nature. But I feel only too certain that milliners and persons who supply them with material will continue to trade in “plumes” as long as there is an available market. Indeed, unless strong measures are adopted and enforced by Government for the prevention of killing birds and exposing their skins and plumes for sale, I very seriously doubt whether any remarks, be they ever so strongly expressed, which may appear in our journals and text-books, will do much good. We must get at the buyers and wearers of bird-plumes rather than the sellers. We must endeavour to the utmost to impress our lady friends with the fact that the “plumes” which they wear in their hats are not ornamental decorations *as fashion fancies have taught them to believe* ; in reality they are hideous contorted effigies of what were once lovely birds. For many years I have made it a practice to acquaint women, old and young, with the fact that I strongly object to see the remains of birds stuck in their hats. I have objected on inartistic as well as sentimental grounds, and I am glad to say that in many cases I have, after a full discussion on the subject, influenced my hearers to accede to my views. Is it not a fact that women, as a race, do not care to wear ornamentation which is not considered “pretty and becoming” ? Supposing, then, that *we* bird-lovers, whose criticisms of fashion on this particular point should carry considerable weight—as *we* are most intimately acquainted with the beautiful form and expression of the living bird, and unanimous in our opinion that in hats they look absolutely abominable—would only fully express on every available occasion to our lady friends our views on the subject, perhaps we might get them to substitute some other

form of hat-trimming. I believe that, if such ideas were more thoroughly ventilated, both in private conversation and from the public platform, that the "plume trade" might dwindle until it eventually became a drug in the market. It is a matter of straining every nerve to influence the buyers not to buy, and I have little doubt that a strong united effort in this direction would not meet with disappointing results. In conclusion, may I add that whenever I have had the pleasure of lecturing in public on birds, I have never allowed the opportunity to pass of expressing in the strongest terms possible how much I deprecate the scandalous habit which is practised by heartless men, even still in this great age of education, of destroying for utterly useless—aye, even for grim—purposes, the lives of our beautiful and interesting feathered friends.—C. J. PATTEN (University College, Sheffield).

P.S.—The above remarks refer chiefly to entire birds used as hat-trimmings. These are by far in a way the most objectionable, owing to the ghastly expression which the glaring and generally wrong coloured glass eyes give to the head, and the manner in which the body, wings, and tail are skewered out of shape. Single hat-feathers may appeal to the admiring eye of some people, though I must confess that to my mind all such decorations seem but a relic of barbarity, especially when we recall to our minds the elaborate and warlike feathered head-gear worn by some of the savage tribes of mankind. Nor are we at all justified in taking life for even the most beautiful of plumes, such as those of the well-known Egret.

Rare "British" Specimens.—Mr. Elms's allusion to the Kentish Plover (*ante*, p. 251), in connection with what he happily describes as "the appalling traffic in British-found eggs," interested me, as I had just received a beautiful fresh foreign clutch of that species, for which I gave in exchange a set of four Yellow Wagtail. There can be no doubt that the demand for "British-killed birds" and "British-taken clutches of eggs" not only threatens the extermination of several local species, as has already been the case with the Honey-Buzzard, but opens the door to many and various malpractices, especially with the facilities now afforded for safe and speedy transit by post from the Continent, and the quick journeys there and back which can now be made without a large outlay of money. I hardly realized this till a friend came to visit me here about a year ago, just after landing at Harwich with some unblown clutches in his possession, one of which belonged to a bird whose breeding-places in the United Kingdom could probably be counted on the fingers of one hand. At the present day an unscrupulous person could probably almost pay the expenses of a

trip to some parts of the Continent by bringing home unblown eggs, and disposing of them as "British." The same thing applies to birds. By the kindness of a distinguished Norwegian naturalist we have specimens of the Eagle-Owl, Snowy Owl, Gos-Hawk, Golden Eagle, and Gyr-Falcon, which have been received in the flesh, skinned, and mounted here. One Snowy Owl in particular arrived by post in such splendid condition that it might have been killed in this county, and its total cost to me, including postage, was well under half-a-sovereign! Perhaps in one case a careful *post-mortem* might have detected an attempted fraud, as a Snowy Owl I set up had its stomach full of fresh Lemmings, but it would be absolutely impossible to say whether an unblown clutch of White-tailed Eagle had or had not been laid in the British Islands. The market value of an admittedly foreign pair of eggs is about seven shillings, while a "British" set still unblown would find purchasers at twelve or twenty times that amount. A reference to last year's 'Zoologist' (p. 228) will show the exorbitant prices paid for the eggs of some other species. — JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

AMPHIBIA.

Occurrence of the Edible Frog (*Rana esculenta*, forma typica) in Surrey.—During last August I was surprised to find a small pond at Ockham alive with the above species. Not knowing before that these Frogs occurred in the county, I caught two (male and female), which I took to Mr. Boulenger, of the British Museum, and he supplied me with the following information of their introduction into Surrey:—

"Large numbers of Edible Frogs of the same variety (forma typica) were turned loose in small ponds near Chilworth by the late Dr. St. George Mivart, the specimens having been sent to him from Brussels by Mr. Boulenger. The following year Dr. Mivart again imported large numbers from Berlin, mostly of the variety *ridibunda*."

A few remarks on the habitat of this Frog may not perhaps be out of place here. They have a wide range, extending over the greater part of the Palearctic region, and encroach upon the Ethiopian and Oriental regions. It is absent from Ireland, Scotland, Norway, and North Russia. In Asia it is not found north of Mongolia, Manchuria, and the Central Island of Japan. In the south it is found in Madeira, the Canary Isles, Morocco, north coast of Egypt, the head of the Persian Gulf, North Persia, Baluchistan, Turkestan, South China, Formosa, Hainan, and Siam. It occurs in few places in England, namely, Cambridge in Foulmire Fen, Thetford and Scoulton in

Norfolk, where, Mr. Boulenger informs me, it was introduced one hundred years ago. This species breeds in July. They have a very loud and noisy croak, and, indeed, it was owing to this that first drew my attention to them at Ockham. — GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

PISCES.

Capture of a Burbolt in Cattewater.—Mr. Richards, of 4, Hewers Row, Plymouth, whilst fishing for Bass, &c., at Turnchapel, caught a fine specimen of *Lota fluviatilis*. He was using the usual tackle on a rod. The fish measured $18\frac{1}{2}$ in. long, and weighed about a pound. It belongs to the Codfish family, but exhibits some of the peculiarities of the Eel, and is sometimes called the Eel Pout. It is very rare in this district, and is usually taken in estuaries where there is fresh water. As stated by Couch, it is known as the Coney-fish, from an opinion formerly held that the creature called the Coney in the sacred Scriptures—the Arkeeko of Bruce—is the same with our common Rabbit; and this fish so far imitates the animal of the land as to pass much of its time, and seek its shelter in holes and overhanging banks of the rivers it frequents. It is common in Sweden, the North of Europe, and also in Siberia, as well as India. It is considered a delicacy, but its roe is said to be poisonous. At my suggestion, Mr. Richards presented it to the museum here.—WILLIAM HEARDER (195, Union Street, Plymouth).

To what Height can a Carp spring from the Water?—Most anglers and many dwellers near fish-ponds and meres are familiar with the sound of the heavy splash of a Carp. Have any of our readers noticed how far this fish can leap from the surface of the water? One of my sons returned recently from a day's fishing, bringing home in his can four specimens of *Cyprinus carpio*, averaging in weight about half a pound each. These were placed in a butt, the water of which did not reach within rather more than twelve inches of the top. One Carp threw itself out a few nights after, was found in the morning, and returned to its companions, apparently little the worse for the adventure. The following night another fish performed the same feat, this time with fatal effect. This seems a high leap for a Carp, as it naturally had to clear the top of the butt as well, but it is probably not unusual.—W. L. DISTANT.

NOTICES OF NEW BOOKS.

Report on the Sea Fisheries and Fishing Industries of the Thames Estuary. Part I. Prepared by Dr. JAMES MURIE. Waterlow Bros. & Layton, Lim.

THE notice of this real contribution to natural history is a little belated; it is not the fault of author or publisher, but it having been sent to an old address of the Editor, the local postal authorities adhered to a rigid, hide-bound, red tape intelligence, and the book has only just reached our hands.

We know, more or less, the fauna of the Upper Thames, but of its estuary very little, especially of its ichthyology. 'The Zoologist' has contained from time to time many notes and some lists of its avian features, but of the inhabitants of its waters scarcely anything was known, save what information could be derived from the professional fisherman, the amateur angler, or the commercial fishmonger. Its surface is carefully buoyed, and its beacons and tides understood by the pilot, the strength (?) of its forts pigeon-holed at the War Office, and its charms—for it has such—appreciated by the Thames excursionist; but Dr. Murie is the first naturalist who has given us any real contribution to its biology. And yet there has long been an ample material to utilize. There are "North Sea or deep-sea trawlers (Ramsgate, Dover, Folkestone, and Brightlingsea); offshore and inshore fisheries (Harwich, Tollesbury, West Mersea, Margate, Deal, Dungeness, &c.); estuarine fisheries (Maldon, Sheerness, Queenborough, Southend, and Leigh); besides the great shell industries (Whitstable, Faversham, Burnham, &c.), so characteristic of the conjoint counties"; in fact, there was just the opportunity for a competent naturalist to write an instructive and pleasant book, which we should like to see on sale on every Thames excursionist steamer. For real biological information is not an esoteric doctrine, nor need it be written in an unknown

tongue, so far as terms and definitions are concerned ; and we really believe that even the excursionist, who knows his river so well, would like to know more of its inhabitants, but is under the impression that such information can only be obtained by the wise and prudent with scientific training, and is fain to think that a purely technical jargon always represents knowledge. And thus the great democracy, with its angling, gardening, bird and beast keeping proclivities, is generally without the least biological knowledge that can in any way be called scientific !

Dr. Murie resides at Leigh, and this little-known fishing station can now rank among those localities enshrined in the literature of natural history. The story of its evolution from a fishing village to a fishing station is related, and just as most sportsmen have an unrecorded warm corner in their hearts for the poacher, so the hardy fisherman will feel an interest in the story of "Smugglers and Coastguard," as told in this volume.

A mass of information is contributed as to the life-habits, including migration, of the fishes found in the Thames Estuary. The enumeration of the various vertebrates and invertebrates that constitute what is generally called Whitebait is very ample. The River Lamprey (*Petromyzon fluviatilis*) is common, and we well remember taking one of these fish in the Ravensbourne, near Ladywell, many years ago. The Sturgeon can scarcely now be considered a Thames fish, though one was landed near Westminster Bridge, in 1867, which measured 7 ft. in length, and weighed 60 lb. The Bass, beloved by sea-anglers, still ascends the estuary, and is sometimes caught at Southend Pier-head. "For several months of the year, in the Thames estuary and the creeks along the Essex coast, Herrings of various ages and stages of growth muster in considerable force."

Of Mollusca, we read that on the Essex side of the Thames some of the oldest oystermen recall in mind when self-raised native Oysters were regularly taken in fair numbers inside the old Leigh-Middle, and on the Marshend side (Canvey) of the Channel. Leigh is the chief centre of the cockling (*Cardiidae*) trade ; the largest Cockles which Dr. Murie has examined came from Whitstable Bay, and the united shells of one—dried after cooking—measured $1\frac{1}{2}$ in. (over) transversely, and $1\frac{1}{2}$ in. long diameter, and $1\frac{1}{2}$ in. thick. But we must not quote further

from a book we have found a mine of information that we could not procure elsewhere.

Handbook to the Natural History of Cambridgeshire. Edited by J. E. MARR, Sc.D., &c., and A. E. SHIPLEY, M.A., &c. Cambridge University Press.

THIS book was compiled and published to appear at the time of the late meeting of the British Association at Cambridge, and, as stated, its object is to afford help to those students of natural history who desire to make observations in the Cambridgeshire district. Among well-known authorities, A. H. Evans deals with the Birds, H. Gadow with Reptiles and Amphibians, and R. Lydekker with Vertebrate Palæontology. The insects are attended to by a number of rising entomologists, while the Physiography, Geology, Flora, and Prehistoric Archæology receive full and careful treatment.

EDITORIAL GLEANINGS.

IN the last Report of the Zoological Gardens at Giza, near Cairo, by the Director, Capt. Stanley S. Flower, there are some interesting notes relating to the prisoners of the aquarium.

Fam. MORMYRIDÆ, *Gnathomenus cyprinoides* (Anooma).—Though in a state of nature their habits are apparently nocturnal, in captivity they soon learn to feed by daylight, and eagerly devour the finely chopped-up earthworms on which they are fed daily.

Fam. CHARACINIDÆ, *Hydrocyon forskali* (Kelb-el-Bahr, or Dog of the River).—The Kelb-el-Bahr is very active and voracious, feeding only on live fish, such as *Alestes*, which it pursues and captures with lightning-like agility, and either swallows whole or bites right in half, swallowing the half seized. It is found necessary to keep a lamp burning near their tanks all night, as if left in complete darkness they damage themselves swimming violently against the walls of the tank, but with a glimmer of light they avoid this.

Fam. SILURIDÆ, *Clarias lazera* (Armoot).—These fishes are fed on raw meat, and eat large quantities of it. After a meal the distended stomach quite alters the general appearance and shape of the fish. With a sufficiency of food a crowd of individuals will live amicably together, but hunger leads to internecine warfare.

Fam. SERRANIDÆ, *Lates niloticus* (Ishr, or Great Nile Perch).—One of the most noticeable points about the Ishr is its gleaming eyes, which in some lights glow red like dull signal lamps; another is its power of rapidly changing its colour, and the appearance and disappearance of dark markings all over the sides of the body; further observations are wanted concerning when and how this is carried out.

Mammals in captivity seem to have a considerable mortality. Twenty accidental deaths include nine Jackal puppies eaten by their mothers, a Lion cub which choked itself eating a piece of meat, an Angora Goat which fell into a canal and drowned, and several animals and birds which met their deaths fighting their companions in the same cages.

Among other deaths, six of nine Lemurs died of dysentery (ulcerative colitis) between Jan. 11th and Feb. 26th, one died from the result

of an accident, one apparently from old age, and the remaining one from unknown causes. Several of the Monkeys died from dysentery about the same time as this disease appeared among the Lemurs; three died of tuberculosis; others of pneumonia and severe constipation, but, as usual in many cases, it was impossible to determine the cause of death, all the organs appearing healthy.

AN unusual incident occurred on a recent Sunday in St. James's Park. Just when the walks were beginning to be thronged by visitors after church, the birds were seen to be in a great state of perturbation, huddling together, or hurrying to take shelter in the bushes. The cause was soon discerned in a Hawk, which soared in wide circles over the park, at a height of eighty or a hundred yards. Presently an unwary Pigeon came in view, flying in the direction of St. James's. The Hawk made a swoop, and struck the Pigeon, which fell into the shrubbery on the north side of the lake near the bridge. The Hawk remained poised in the air, and then circled round and round again, rising and falling, and sometimes swooping so low in search of its quarry that it would have been an easy shot. After about a quarter of an hour it gave up the search, and soared away westward. Soon afterwards the Pigeon fluttered out of the shrubbery on to the mown lawn, and lay there helplessly beating its wings. A park-keeper, whose attention was called to its condition, speedily put it out of pain. It was found to have a deep wound in its breast, large enough to put the end of a finger in. The park-keeper said that during a long period of service he had never before known such a thing to happen, and had never noticed a Hawk near the park. It was certainly a surprising instance of audacity, though it was surpassed about two years ago by a Hawk actually killing a Pigeon right in front of the Guildhall during the busiest time of the day.—*Shooting Times and Brit. Sportsman.*

THE actual records of net-fishing tend to make one sceptical of all theories, whether propounded by men of science or sportsmen, to account for the increase or decrease of fish. Take Salmon, for example. How carefully it has been explained, over and over again, that a great supply under modern conditions is impossible. But suddenly, and without any assignable reason, the Salmon have returned in unheard-of numbers to the Tweed and its tributaries. Few sportsmen who had the luck to share last autumn's fly-fishing will forget it, and the catches by net during the present year have, says 'Country Life,' been

also unparalleled. In one cast of the net forty-two fine fish were taken from one of the less important tributaries a few days ago. The truth is, we know very little of the life-history of fishes. A few years ago it was believed that the shoals of Herring had been driven from our shores by steamships and trawlers, and yet the last two seasons have broken all previous records.—*St. James's Gazette*.

IN the 'Avicultural Magazine' for August, Mr. D. Seth-Smith records his success in breeding in captivity the Tataupa Tinamou (*Crypturus tataupa*), a Brazilian species. A peculiar habit of the adult bird, when alarmed, was recorded by Azara, of squatting on the breast, and throwing the tail into the air, forming the under tail-coverts into a screen to hide the rest of the body, and thereby becoming practically invisible amongst herbage or undergrowth of any kind. Mr. Seth-Smith also found this habit developed to a moderate extent in the very young chicks; they too will, when they suspect danger, squat and throw up their little tails, almost always arranging that the latter shall be towards the object of their alarm.

A Sign of the Times.—A church has been converted into a museum under municipal control at King's Lynn.—*Museums Journal*.

WE have received a privately printed Catalogue of the Australian Birds' Eggs and Nests in the collection of Dr. Le Souëf, the Director of the Zoological Gardens, Melbourne. We quite envy Dr. Le Souëf in its possession, and it forms in itself a considerable addition to the knowledge of Australian ornithology.

WE understand that Mr. Richard Kearton has made such an excellent recovery from the operation he recently underwent for appendicitis, that he is now hard at work writing his new Nature Story Book, and that it will be published by Messrs. Cassell & Co. during the autumn.

THE study of economic entomology as applied to agriculture has long been a feature in the enlightened domestic policy of the United States Government. A vindication of this work may be found in a "Report on the Habits of the Kelep, or Guatemalan Cotton-Boll-

Weevil-Ant," by O. F. Cook ; published at the Government Printing Office, Washington.

An ant has been discovered in Guatemala which attacks and kills the adult Boll-Weevil (*Anthonomus grandis*, Boh.), and thus holds this most injurious insect in check, and permits the regular harvesting of a crop of cotton, even under conditions favourable to the weevil. This ant, known as the "Kelep" in the Kekchi language of Alta Vera Paz, Guatemala, is carnivorous and predaceous; it injures no form of vegetation, and takes nothing from the cotton-plant except the nectar secreted for it on the leaves and floral envelopes. The habits and temperament of the insect are such that it is readily capable of domestication, transportation, and colonization in the cotton fields of Texas. Many colonies have already been introduced at Victoria from Guatemala, and a peculiar habit of these ants was observed. When the insects were being liberated after a month of captivity, almost the first thing they did was to bring out their dead ants, and carry them as far from their nests as the boundaries of their enclosures would permit. It now remains to be seen whether the Keleps will survive the winter climate of Texas, and whether they can be obtained or propagated in sufficient numbers to serve the practical purpose for which they have been introduced.

THE ZOOLOGIST

No. 760.—October, 1904.

NOTES ON THE ORNITHOLOGY OF OXFORDSHIRE, 1902.

By O. V. APLIN, F.L.S.

JANUARY, 1902.

3rd.—Song-Thrush singing; the first I have heard this winter. Some very fine Bramblings, with a very large flock of Sparrows, and some Tree-Sparrows and Chaffinches; also a big flock of Larks, which looked very small, all feeding in a stubble-field recently spread with manure. Winter aconite flowering.

5th.—*Galanthus Elwesii* and *Cyclamen Coum* in flower.

6th.—Mistle-Thrush singing. Big flock of Fieldfares. Goldfinches are tolerably common this winter.

9th.—Examined, at Mr. Bartlett's, a Corn-Crake, shot close to Banbury about Dec. 23rd last. Also a Grey Crow, the sixth local example he has had to stuff this winter.

15th.—Sharp frost, 19°.

22nd.—Mistle-Thrushes noisy, and seem to be pairing.

25th.—Lesser Redpolls in my orchard, feeding on seeding plants of milfoil; they have been in the habit of coming for nearly a month.

FEBRUARY.

2nd.—Strong wind from N.N.E. the last four days, and frost. A gale to-day.

3rd.—Mistle-Thrushes noisy (fighting or pairing) when they came for holly-berries.

5th.—Nuthatch with succession of long whistles. Snow on the ground.

8th.—Some more snow. In my orchard a male Stonechat (still in dull winter dress, but showing the collar and dark head) was haunting some holes which had been dug for planting apple-trees. Close to it a Lark was running about. It is most unusual to see either of these birds in such a situation, as it is quite in the village, and surrounded by houses.

10th.—Mistle-Thrushes feeding on holly-berries in front of the house. A few days ago they were noisy when they came to feed, chasing one another, either in anger or love, so that they could hardly get anything to eat; now they are tame with hunger, and only think of swallowing as many berries as possible.

15th.—Hard frost continues. On one of the hilly fields at Milcomb I saw a party of half a dozen Meadow-Pipits; this is unusually early for them to be seen in a flock, and on the uplands. The few that stay the winter with us are usually seen singly, in wet meadows or about sheep-pens on turnips. Several Fieldfares in the garden.

16th.—Very severe frost. Redwings in a bird-cherry within a few feet of one of the windows.

21st.—Milder. Song-Thrush sang again.

24th.—Chaffinch sang.

MARCH.

1st.—The first genial day this season.

2nd.—Snowdrops only now making a good show. Crocus coming out.

3rd.—A Blackbird's nest appeared to be finished to-day; in ivy on oak-tree.

6th.—News of some Wild Geese, which flew over a farmer's head only a few yards from the ground, at Windmill Hill, early on Sunday morning (2nd).

10th.—Some apricot-blossoms expanded.

16th.—Hot spring day. Two pairs of Peewits on a ploughing. Several Sulphur Butterflies, both male and female.

18th.—Several Yellow Buntings singing.

22nd.—Mr. Fowler observed the Chiffchaff at Kingham.

23rd.—Long-tailed Tits building.

27th.—Wheatear on big open grass-field near Crouch Hill—a favourite spot for them.

28th.—As nice a Good Friday as I ever remember ; a most lovely warm spring day ; the peach-blossom on the wall is “ a sight to behold.”

30th.—The Blackbird’s nest which looked finished on the 3rd stood empty for some days, and to-day has four fresh eggs. A Song-Thrush has built a nest on the top of an old Flycatcher’s nest placed on the top of a wall plum-tree. The nest is small, but on one side is a mass of old dry midribs of horseradish leaves, which hang down and make the nest very conspicuous. There is a horseradish-bed near the tree. The nest contains four eggs, small and oddly marked, few markings, and most of them at the small ends of the eggs.

31st.—Kestrels pairing.

APRIL.

1st.—When Otter-hunting on the Ouse, near Buckingham, just where that river touches Oxfordshire, I saw a last year’s Reed-Warbler’s nest in the reeds. Heard the Chiffchaff, and put up a pair of and two single Wild Ducks.

5th.—Blackcap in garden.

11th.—Saw a Comma Butterfly in the garden, which eluded me, and flew over the wall ; but by great good luck I caught it up, and captured it in my neighbour’s stackyard. This is the only one I have seen here.

12th.—Not a migrant to be seen or heard, except another Blackcap near Banbury. A single Swallow reported as seen on the 8th. Bitterly cold lately ; wind N.E., with morning frosts.

18th.—Sharp white frost, and ice as thick as a penny at 7.30 a.m., but nice sunny day. A rush of migrants—Willow-Wrens, Chiffchaffs (the first observed here), and Redstarts. Barred Woodpecker jarring. Put a Crow off its nest.

14th.—Swallow.

15th.—Many Swallows over Evenlode at Charlbury, and two House-Martins higher up the river.

18th.—Tree-Pipit, Lesser Whitethroat (common), Grass-hopper-Warbler.

19th.—Cuckoo heard several times.

21st.—Examined, at Mr. Bartlett's, a white Starling, shot at Barford on Nov. 8th; a Black-headed Gull in full dress, shot at Hook Norton on March 2nd; and a Wryneck (a scarce bird here), shot at Banbury on March 26th; also a curious small Brown Owl, shot near Shotteswell in the middle of January.

23rd.—A Long-eared and a Natterer's Bat, found by men mending a roof, sent to me.

24th.—Mr. Whitaker and I noticed several Nightingales, Whinchats, and Whitethroats. Also the Wood-Wren near Epwell, and that the Sand-Martins had arrived at their breeding quarters in Tadmorton sand-pit.

25th.—Nightingales last year and this were and are more common about here than they have been for a long time; several near the village. Ray's Wagtail, Sedge-Warbler. Magpie's nest with six eggs.

27th.—Mr. A. H. Macpherson and I saw a fine Wheatear of the large race on one of the hilly fields covered with old ant-hills at Milcomb; the salmon-buff of the neck and breast was very rich. Flushed a Snipe near Broughton.

28th.—Noticed half a dozen pairs of Peewits about these hills.

MAY.

3rd.—A nice lot of Goldfinches singing about the village this spring. Cuckoos are scarce.

4th.—The Hedge-Sparrow at this time of year warbles in an undertone—a much richer song than his usual one.

5th.—Marsh-Tit's nest, with eight eggs, in a hole in a very large old apple-tree; nest of moss, wool, cat's fur, and thistle-down. Barred Woodpecker's nesting-hole, found on April 26th, opened to-day. The male was inside, but nothing else. It was in the rotten wood of an old pollard-willow, about $1\frac{1}{2}$ in. in diameter, went in about 7 in. and down about 9 in., and was a good 3 in. across at the bottom.

6th.—Left home for a month.

JUNE.

9th.—Left home until 13th.

18th.—Red-backed Shrike in the old haunt in the Milton lane.

23rd.—The first really warm day this summer.

25th.—Partridge's nest of thirteen eggs, just ready to hatch, mown out.

26th.—Another of twelve in the same clover-field about half incubated.

27th.—To Kingham to see Marsh-Warbler's nest in osier-bed. The "handles" not so high as usual. Nest substantially made, supported by two osier and two nettle stems, the handles being attached to the osiers. The nest was lower down than usual (about two feet from the ground). A little hair in the lining. It contained four eggs (laid by the 24th or earlier), which had the ground colour almost white, marked with a zone of dark clear markings.

28th.—The last week has been hot, with a wind (chiefly E.) almost as dry as sirocco. For some days the Lesser Whitethroat has sung regularly close to the windows in a bird-cherry tree. For the third year in succession a Red-legged Partridge has hatched her eggs on a straw-rick at a field-barn in Broughton quarter.

JULY.

2nd.—Cuckoo in full song. A Song-Thrush has sung for some time (chiefly in the evening) from the ridge of the stable-roof.

4th.—Starlings feeding young in a hole in the walnut-tree. Starlings nested in the same hole in April.

9th.—Mr. R. W. Calvert and I heard the Cuckoo in full song at Langley early in the morning, and again in the evening. This is the latest date on which I ever remember hearing it. Probably the cold spring (it was said to be the coldest May for sixty years) retarded the Cuckoo's breeding. On the 17th Mr. Fowler wrote word that he had a young Cuckoo in a Whitethroat's nest at Kingham. In the cold wet summer of 1879 I heard the Cuckoo on July 4th, and in 1888 (another cold season) on the 5th.

11th.—A most destructive frost! It damaged potatoes, vegetable-marrows, and kidney-beans in many gardens, and in the allotments. But in my home-garden, which lies high, I got no frost. The thermometer on the wall only down to 42°, *i. e.* about 38° on the ground. A frost like this would probably kill some young birds on the low ground.

15th.—Examined a nice adult female Hobby, shot on or about June 23rd near Hanwell. Another bird was seen. There is no doubt that the Hobby would breed every year in small numbers in Oxfordshire if it were not molested. Unfortunately this useful bird is regarded as a "hawk" simply.

28th.—Grasshopper-Warbler singing at Milcomb Gorse; this bird sings late in the season.

AUGUST.

1st.—Barred Woodpecker near Charlbury.

3rd.—The drought is severe now, and damaging what little fruit there is. Many Warblers (Blackcaps, Garden-Warblers, Lesser and Common Whitethroats) in kitchen-garden.

4th.—A pair of Swallows are building in one of my pigsties, occupied by two pigs! The walls of the sty-yard (6 ft. by 7 ft.) are $5\frac{1}{2}$ ft. high. The birds have to drop down into this yard, and then shoot in at a doorway $4\frac{1}{2}$ ft. high and $2\frac{1}{2}$ ft. broad. The nest is on a crossbeam, 6 ft. from the ground. I think the birds chose this curious situation for the sake of coolness (only the early morning sun falls on the roof), for there is plenty of room for Swallows to breed in a wood-shed and a barn (in both of which some birds breed every year) close to the pigstye. I notice, too, that the Swallows which breed in the wood-shed always build under the north slope of the roof. The scarcity of Swallows is now evident; no doubt many perished in the cold weather in May.

6th.—The first good rain since the middle of June.

12th.—Saw a Green Sandpiper in the Cherwell valley.

15th.—Many Swifts in the forenoon. Chiffchaff singing in a very low tone in the garden for the last two or three days. Blackcap singing in the holly-tree by my window; only the low preliminary notes.

16th.—Close and hot at times. Between twelve and one o'clock numbers of Starlings hawking for flies over the village; the sky was dotted over with them. Roughly speaking, they were all from 200 to 600 ft. high, calculating from the church-spire, which is 198 ft. high. Many Warblers in the garden. The Swifts, I think, have gone.

19th.—Nuthatch "trilling."

20th.—Examined a Cormorant (a bird of last year, I think), which, on the 15th, startled some passing gentlemen near Banbury by falling out of a tall elm-tree on to the ground in front of them. It was probably exhausted after a long flight. About the same time I saw a report of another Cormorant seen on the Thames at Henley.

25th.—Mistle-Thrushes in flocks. One Swift at Milcomb.

SEPTEMBER.

1st.—Very little corn cut—too little to permit of much shooting.

2nd.—Flock of Peewits in turnip-field.

3rd.—Some Meadow-Pipits in swede-turnips.

10th.—Very wet harvest weather.

13th.—Shot over part of our beat for first time; several fields of barley uncut; a fair lot of good young birds. We saw no Land-Rails, although we walked through a great deal of standing corn. I saw one come out of a field of oats which was being cut on the 6th.

15th.—Swallows have young in the pigstye.

16th.—A big flock of Peewits in turnip-field; one old bird weighed 8 oz., and a fat young one 8½ oz.

19th.—Young male Sparrow-Hawk shot at South Newington.

20th.—For several days (hazy mornings) a great congregation of Swallows and Martins on this house-roof.

25th.—Beautiful autumn weather; hazy mornings and bright still days. Fewer Swallows and Martins.

OCTOBER.

1st.—Meadow-Pipits in little flocks.

6th.—A small flock of Martins about the village.

8th.—A good many Jays about. News of a Land-Rail flushed from standing barley on the 2nd.

15th.—Grey Wagtail at a farmyard pond at Milcomb; it appeared by the village brook the last week in September.

18th.—Mr. Calvert told me he saw a Golden Plover on one of his fields at Langley a day or two ago. He often sees odd ones, and sometimes a small flock visits him.

23rd.—Saw one or two Bramblings about the beech-trees near Great Tew. Examined, at Mr. Coombes's, a young female Peregrine Falcon, killed in August at Rodford, near Enstone.

25th.—Song-Thrush singing well, and again next day.

27th.—Fieldfares in some numbers.

28th.—Redwings.

29th.—Many of both species. Jays seen all about; there has clearly been an immigration. Larks in good flocks.

NOVEMBER.

4th.—Jays very much in evidence about the Grove.

11th.—Song-Thrushes continue to sing.

12th.—Very warm and pleasant. Linnets and Yellow Bunting singing!

14th.—Very nice weather. Song-Thrushes in fine song.

17th.—Gathered a bunch of roses of various kinds in good condition.

18th.—Hard white frost.

26th.—Received a partly skinned Peregrine Falcon, shot about three miles north of Oxford on the 21st. It is a young female. Weight, 2 lb. 10 oz.; total length of skin, 20·2 in.; wing, from carpal joint, 14·7 in.; cere bluish grey; legs pale dull yellow; bill blue-grey, tip dark horn. Vast flocks of Wood-Pigeons have arrived here, but I reserve an account of this great invasion until the end of these notes. We may now, however, expect to hear of Peregrines, which live chiefly on Wood-Pigeons when they visit us.

DECEMBER.

2nd.—On the Grove estate I noticed both Barred and Green Woodpeckers; the latter makes a hollow rattle with the first few beats of its wings as it flies from one tree to another.

4th.—Sharp frost, sunny; snowed a little. Mistle-Thrush sang, but only a few notes.

5th.—Half a dozen Meadow-Pipits about a sheep-pen. Hard frost.

9th.—Not many Fieldfares now, but a good many Redwings, and a fair number of Song-Thrushes.

10th.—Corn-Bunting strung together a few notes.

11th.—Mr. Bartlett showed me an immature Golden-eye and a Green Sandpiper in the flesh, shot in the Cherwell valley near King's Sutton. The Tree-Creeper, flying down from the top of one tree to the base of another near at hand, has quite a spiral flight.

13th.—Mr. W. Horwood, of Caversfield, reports that great numbers of Jays have visited the "Spanish" oaks in Middleton Stoney Park, and over a hundred have been shot. Also that Larks are now to be seen in large flocks. On the 5th inst., between Stratton Audley and Caversfield, he saw a large flock fly across the road, and no fewer than six of them struck the single telegraph-wire, and were picked up. The sun was bright at the time. Mr. Horwood thinks they were migrants, and that residents would not have struck in this way. He also reports that he saw a beautifully pied Blackbird in Caversfield parish on the same day. Weather turned mild again.

21st.—White aconite flowering.

22nd.—Song-Thrushes singing grandly after a short interval, especially early in the dark mornings. Starlings chatter and whistle almost like spring.

25th.—A beautiful sunny spring-like day; I never before knew so beautiful a Christmas Day. The weather for some days about this time was like that of a very nice March.

29th.—Saw a male Sparrow-Hawk; and, of bright-coloured birds, Goldfinch, Bullfinch, Green Woodpecker, and Kingfisher.

31st.—Attracted by the outcries of Rooks in the paddock-walk, I saw a Peregrine Falcon (a female from the size) flying away. In some alders over a score of Goldfinches were feeding like Redpolls; also three of the latter. Primroses and violets flowering in the garden.

I have received news from Mr. W. W. Fowler that he had had reported to him two Swallows seen in Port Meadow on the 21st, a wonderfully warm day (*in lit.*).

The Rev. F. C. R. Jourdain writes me word that on a cold day (some snow on the ground) about the end of November, 1884, he saw, on a scrubby bit of hedge bordering the Holywell football-field, Oxford, two little birds dodging about. He watched them for some time at close quarters, and was particularly struck

with the peculiar colour of their irides. Their general shape and habits reminded him of the Whitethroat's. With the aid of Gould's 'Birds of Great Britain,' any doubts he felt about their being Dartford Warblers were set completely at rest (*in lit.*, Oct. 18th, 1902).

Autumn Nesting.—Many birds nested, or tried to nest, this autumn. A Robin's nest with four eggs was found near Banbury in November ('Banbury Guardian'). A Wren built a nest in an Irish yew here in November. Rooks in two rookeries here built nests. Mr. Digby Pigot reported that during the week ending Nov. 22nd a Thrush hatched out young ones, and a Starling and Wren had eggs at Sarsden (Bull. B. O. Club, xiii. p. 26). Starlings were about my buildings just as they are in spring, but were not seen to build. I used to see Sparrows carrying up feathers and hay in front of the house. Mr. Fowler wrote from Oxford, on Dec. 3rd, that he had seen a fresh Sparrow's egg broken on the ground the day before, "and even this cold morning I saw a Sparrow with a feather in its bill. At Churchill the boys have lately found a Blackbird's nest with eggs (one, I think); also a Starling's, Robin's, and Wren's, all with eggs."

The autumn was not remarkably mild and genial, and I can hardly account for so many birds attempting to breed at this unusual season. Possibly the cold wet weather which prevailed during the breeding season prevented many of them from rearing their young then, and they tried to mend matters later on. If so, the short spell of severe weather early in December put an end to the attempt.

The most important ornithological feature of the autumn of 1902 was the vast invasion of Wood-Pigeons which took place in North Oxon in November and December. I may premise that we are in this district not accustomed to seeing the great flocks of Pigeons about which one hears in other parts of the country. A flock of about two hundred we see sometimes, and that but rarely.

On Nov. 25th a neighbour told me that he had about two thousand on his clover-fields. On Dec. 2nd I put up, from a

barley-stubble with clover on the Grove, a flock which I estimated to contain from one thousand to fifteen hundred, which went off, about 3.30 p.m., in a long "stringing" flock towards the Aynhoe Woods; another flock, quite as large, passed a little later, heading towards the wooded high ground at North Aston. The next day I heard of vast flocks on the Barford side of the parish, and at Heythrop, and the Northamptonshire borders; and during the next ten days I heard of their remarkable abundance all over the district.

By the 10th they seemed, if anything, to have increased, although during their stay they had been subjected to an almost constant fusillade, and hundreds were killed. To-day I saw, in a large barley-stubble, five or six thousand at least. When they rose they filled the sky; some Rooks rose at the same time, and it is not often one has a chance of seeing so many birds of any kind at one time. Certainly I never before saw so many land-birds at once. On an adjoining farm twelve were killed (and picked up) at one shot to-day. They disappeared rather suddenly by the 15th.

During the cold week (4th to 11th) the Banbury poulterers' shops were full of Pigeons. One man on the 11th had one hundred and eighty lying in a heap.

The best bag I heard of being made by one man was near Shenington, *viz.* one hundred and six birds in two days. They sold for fivepence each (and were retailed at one time at eightpence), but during the slump they came down to twopence each, and they were retailed as low as sixpence. At this price they were very cheap, for I had never before eaten Pigeons in such good condition.

All the birds I examined had been feeding on barley, with a very few clover-leaves in some cases. This good living made them very fat, with a layer of fat under their skins. They were not very large birds; a bunch of six weighed $7\frac{1}{4}$ lb. The heaviest I weighed was 22 oz.

Where they came from is not known. Why they came is a matter of conjecture. It was said that there were no acorns and no beech-mast in some parts of the country where great flocks of Pigeons usually feed. Hence the necessity for emigration. But why they stayed with us was very clear. The harvest

of this year was a long and lingering one, with much wet and stormy weather, although the corn ripened in good time. The natural consequence was that there was in the fields an unusually large quantity of "shed-corn" lying about. Indeed, I never previously saw anything like such a quantity. In some fields it (especially barley) was strewn quite thickly. On this the Pigeons fed, and they really did some good by clearing it up. They came in mild weather; the advent of hard weather made no difference to them; and they left rather suddenly, just as the weather turned mild again. It was evident that they had eaten the corn up, and we were glad they went without resorting to the clover-leaves and turnip-tops.

NOTES ON BIRDS OF THE NARIN DISTRICT, CO. DONEGAL.

By W. C. WRIGHT, M.B.O.U.

THE tract of land to the north of Ardara, bounded on the south by Loughros More Bay, on the north by the Gweebarra Bay, terminating in the west in Dawros Head, and bounded on the east by the road running from Ardara to Narin, I have termed, for convenience' sake, the Narin district of Co. Donegal. It is fairly well cultivated, and, as is the case with the whole of Co. Donegal, well-watered, there being a large number of small loughs, the largest being Kiltooris, containing a large island with a ruined castle; Lough Doon, with its ruined bawn or fort in the centre; Loughs Birroge and Pound.

Off the coast lie several small islands, the largest being Inishkeel; it was formerly the site of a small monastery, the ruins of which still remain. This island is held in great veneration by the peasantry, and is visited in pilgrimage every year. Roaninish, a small flat island four miles out in the Atlantic, is uninhabited, and is the breeding resort of a large colony of Storm-Petrels (*Procellaria pelagica*).

On July 27th last I visited this island, and found the Petrels were in the midst of incubation; in a few cases young in down were found in the nest, but I should say laying generally had just commenced, the eggs looking fresh, and a few I took, on blowing, proved so. The difference in size of these eggs is remarkable, some measuring as much as $1.23 \times .87$, others only $1.02 \times .76$.

The young were very pretty little things, the down being a slaty colour. (Cf. illustration on p. 374.) Both male and female incubate, and in every case, when lifted from the egg, the oil was ejected from the bird's mouth; one I held in my hand repeated the operation four times, and when let off it rested on a stone, as if dazed, and then fluttered along the boulders, and out to sea.

The nest in some cases had a scanty lining of grass or seaweed, but in places where sand or small pebbles appeared beneath the boulders, no materials of any kind were used, the egg lying in a small hollow on bare sand. The nests were found only on the north and east sides of the island, amongst large banks of boulders. It was only while in the vicinity of their nests that the presence of the birds was betrayed by the smell peculiar to the Petrel; this odour was very marked as one lay on the top of the stony bank, or removed the stones in search for the nest, when the birds also uttered a peculiar cheeping note.



Young of *Procarraria pelagica* (half nat. size).

Both Common and Arctic Terns were also nesting on this island. Large numbers of eggs much advanced in incubation were lying in little hollows on the grass; young birds were also seen, both in down and some nearly fully fledged.

Ring-Plovers (*Ægialitis hiaticola*) and Oystercatchers (*Hæmatopus ostralegus*) were common. I was surprised to see a Dunlin (*Tringa alpina*), in fine plumage, on this lonely rock. The boatman told me that a pair of Royal Gulls (*Larus marinus*) bred on the island both this and every other year in his memory; the pair sailed majestically over our boat when leaving.

On the sea, between the mainland and the island, were large

numbers of Common Guillemots (*Uria troile*), Razorbills (*Alca torda*), and Puffins (*Fratercula arctica*); whilst a few Black Guillemots (*Uria grylle*) flew past the "Ellas" rocks, on which I noticed a large number of Shags (*Phalacrocorax graculus*) and Herring-Gulls (*Larus argentatus*) sitting. The only other birds noticed on the island was a solitary Wheatear (*Saxicola œnanthe*), and a few Rock-Pipits (*Anthus obscurus*).

The fresh-water loughs near Narin are the breeding-places of large numbers of Common Gulls (*Larus canus*), notably at Lough Birroge, where there is a small colony on a rocky island, and at Lough Doon, where there were a large number. At the beginning of August the parent birds were still haunting this lough, and I saw several young birds on the many small islands still unable to fly.

At Kiltooris Lough there was a very large colony of Common Terns (*Sterna fluviatilis*) nesting on two small low islands. On July 25th, when I first visited the lough, eggs and young were found in all stages, the former from fresh eggs to those just chipped and the young bird emerging, and the latter from young just hatched to those almost able to fly. I placed a downy young one in the water, and found it was quite at home, striking out boldly and swimming. The parent birds kept flying backwards and forwards from the sea a short distance away, bringing fry in their bills; these were lying all over the place in small heaps, having been disgorged before being given to their young for food.

The stench on these islands was very disagreeable, caused by the large quantities of fry and rotting eggs lying about, part of the islands having been submerged by water, and flooding a large number of the nests.

Coots (*Fulica atra*) and Little Grebes (*Podiceps fluviatilis*) were also plentiful on this lough; they frequented the south end, the only part where reeds were growing. I saw several very large nests of the former. A Mallard (*Anas boscas*) frequented this lough; it was seen daily rising from the reeds, and flying over our heads as we were Trout-fishing. All the loughs in this district contain Brown Trout of enormous size, according to the natives, but the angler may consider himself lucky if he gets his basket filled with fish averaging one pound. All the

loughs have stony bottoms and very few weeds, and consequently the feeding for fish is poor; however, the Trout rise well to the fly, and give good sport.

At Lough Derryduff there is a small heronry, and these fine birds can be seen at the edge of most of the loughs, standing patiently on the watch for fish, frog, or anything that might pass their way.

The Common Bunting (*Emberiza miliaria*) deserves its title here; it is, indeed, a plentiful species, and is to be seen sitting on telegraph-wires in the most barren tracts of country; a pair nested in a field in front of the Port Noo Hotel. The young birds were seen early in August being fed by their parents every morning; they sat on a stone wall, and kept up a mournful call until their appetites were appeased. Yellow Buntings (*E. citrinella*) and Reed-Buntings (*E. schœniclus*) were fairly common, the former numerous about Ardara, and of the latter there were always a few pairs at all the loughs.

The only wooded part of the district is at Ardara, and in the Woodhill demesne there I found the Spotted Flycatcher (*Muscicapa grisola*) a numerous species; they were frequenting a portion of the demesne where timber had been felled, and almost from every stump the eye caught the upward dart of these pretty little birds as they flew after insects, and returned again to the same post. The day of my visit (Aug. 1st) I counted over a dozen of these birds. Willow-Warblers and Goldcrests were also numerous.

On Aug. 5th, when returning from Dawros Head, I saw a small flock of Wagtails feeding on the sands close to Rosbeg. On examining them through glasses, I put them down for *Motacilla alba*, the back being light grey, and with large black throat patch. This would be probably in the line of the return migration. On the other hand, I saw a small flock of similar birds about the same time last year on the sands at Trawbreaga Bay, near Malin Head, Co. Donegal. The Pied Wagtail (*M. lugubris*) and Grey Wagtail (*M. melanope*) were scarce. I saw a few of the former near Port Noo, and a pair of the latter at Ardara.

The Linnet (*Linota cannabina*) and Lesser Redpoll (*L. rufescens*) were very plentiful, the former in large flocks near Narin. The male birds were in splendid plumage.

Amongst other birds seen during my fortnight's stay at Narin were the Nightjar (*Caprimulgus europæus*)—one flew against the thatch of a cottage in broad sunlight; a pair of Ravens (*Corvus corax*) flew over Lough Birroge, croaking loudly, and looked as if they were heading for Arranmore, where a pair breed; a Peregrine Falcon (*Falco peregrinus*) flew down amongst the Terns on Kiltorris Lough, but was soon mobbed away; one Long-eared Owl (*Asio otus*) seen flitting across the stream flowing from Lough Pound; Curlew (*Numenius arquata*) were common, seen in flocks of forty to fifty in the evening flying over to Inishkeel Island; Gannets (*Sula bassana*) were often seen fishing in Gweebarra Bay; on July 31st there were very large numbers of both mature and young birds; these were probably home-bred, from our only Irish breeding-station.

BIRD-LIFE IN JERSEY.

By Sergeant H. MACKAY, 2nd H.L.I.

(Concluded from p. 344.)

QUAIL (*Coturnix communis*).—Generally distributed throughout the island during summer, and nests in suitable situations. A specimen was taken as late as Dec. 12th, 1903.

LAND-RAIL (*Crex pratensis*).—Fairly common during summer months.

SPOTTED CRAKE (*Porzana maruetta*).—This species was in former years quite a common summer visitor, but is now exceptionally rare. Mr. Romeril informs me that he has not seen or heard of a single specimen being taken during the past ten years.

WATER-RAIL (*Rallus aquaticus*).—Sparsely distributed in suitable localities throughout the island.

MOORHEN (*Gallinula chloropus*).—Scarce.

GREAT BUSTARD (*Otis tarda*).—Two specimens of this exceptionally rare visitor were shot on King's Meadow in December, 1899. Mr. Romeril showed me an enlarged photograph of one of the specimens which he assisted in setting up. There are no other records of this species having been taken on the island.

LITTLE BUSTARD (*O. tetrax*).—Mr. Caplin has in his collection a fine female specimen of the Little Bustard, which was obtained here on February 4th, 1902.

STONE CURLEW (*Edicnemus scolopax*).—This species is seldom met with, only a few specimens having been recorded. Mr. Caplin possesses a male specimen.

WOODCOCK (*Scolopax rusticula*).—A few birds visit the island about the month of October, but the species is by no means common. I had a specimen sent me for preservation on Jan. 12th this year.

COMMON SNIPE (*Gallinago caelestis*).—Fairly common throughout the island in suitable situations.

COMMON SANDPIPER (*Totanus hypoleucus*).—Common.

GREEN SANDPIPER (*T. ochropus*).—There are a number of

Green Sandpipers on record, but it is considered scarce, as it is only obtained at long intervals.

AMERICAN PECTORAL SANDPIPER (*Tringa maculata*).—Mr. Romeril informs me that about twenty-five or thirty years ago he saw four specimens of this Sandpiper in a field close to his own house. He secured one bird, which is now in his collection, but has not seen or heard of any having been taken in the island since.

WILLOW-WREN (*Phylloscopus trochilus*).—Fairly common during the summer.

WRYNECK (*Iynx torquilla*).—Common during the summer months, especially around Fort Regent, where its loud shrill call attracts the attention of even the most casual observer.

The sea-birds frequenting the shores of Jersey are of considerable variety, although not numerous, the Brent Goose and Common Gull excepted, and are sparsely distributed here and there along the shore. The whole coast of the island is for the most part of a wild and rugged description, a suitable feeding-ground, one would imagine, for almost every variety of sea-bird. The scarcity of specimens is no doubt due to the coast-line being rather thickly populated; besides, the presence of fishermen, bait-diggers, and wrack-gatherers in considerable numbers amongst the rocks at low tide renders the shore practically uninhabitable by sea-fowl.

GREY LAG-GOOSE (*Anser cinereus*).—So far as I can learn, only one specimen of this Goose has been taken here, viz. in December, 1899.

WHITE-FRONTED GOOSE (*A. albifrons*).—This species is a very rare visitor to the Jersey shores, and then only in extremely severe winters. The last recorded specimen was taken on Dec. 8th, 1901.

BRENT GOOSE (*Bernicla brenta*).—Large flocks of these Geese frequent the shores every winter, and I am informed that Mr. Spencer Robin shot no fewer than eighty-four birds during the winter of 1902-08.

SHELD-DUCK (*Tadorna cornuta*).—This species is decidedly rare, and is only obtained during exceptionally severe winters.

MALLARD (*Anas boscas*).—Scarce, a few being recorded each winter.

PINTAIL (*Dafla acuta*).—This species occurs but rarely during the winter months. Mr. Romeril has two finely mounted male specimens in his collection.

TEAL (*Nettion crecca*).—A few specimens usually obtained in winter.

WIGEON (*Mareca penelope*).—Annual winter visitor in small numbers.

POCHARD (*Fuligula ferina*).—A few specimens find their way to the island during the winter, but only at very rare intervals.

TUFTED DUCK (*F. cristata*).—So far as I can learn, this species has not been obtained in Jersey, although Mr. Caplin received a specimen from Guernsey in December, 1899.

KING-EIDER DUCK (*Somateria spectabilis*).—This is one of the rarest specimens I have ever handled. A paragraph in the Jersey 'Times,' stating that an Eider-Duck had been shot at La Roque, and was in the hands of the local taxidermist for preservation, caused me to interview that gentleman for the purpose of examining the bird in question. In place of the Common Eider, I was surprised to find a female specimen of the King-Eider, a species much more rare than the former. I examined this bird most carefully, in order to ensure correct identification. This species may be recognized by the feathers on the upper mandible reaching down to the nostril; besides, its colour consists of two shades of brown only, whereas the colour of the Common Eider is chiefly buff, the tail being dull black. This example tallies in every respect with the description given in the 'Manual of British Birds,' with the exception of size. The 'Manual' states that the length of wing of the King-Eider is 10 in., whereas the wing of the specimen referred to measures 10½ in., almost the same length as the wing-measurement of the Common Eider. However this may be, the distinctive markings are too much in evidence to admit of any doubt as to its identity, and its larger size may be easily accounted for by the fact that variations in size must naturally occur amongst members of the feathered world, just as they do in every other department of the animal kingdom. The specimen is still in Mr. Caplin's possession, who, I am sure, will be pleased to furnish any information regarding it.

COMMON SCOTER (*Edemia nigra*).—This species is obtained

but rarely around these shores, although several specimens have passed through Mr. Caplin's hands from time to time.

RED-BREASTED MERGANSER (*Mergus serrator*).—This species is met with occasionally, but principally during hard winters, as many as four being taken in one season. Mr. Caplin has one in his possession which was shot on Dec. 21st, 1908.

RINGED PLOVER (*Ægialitis hiaticola*).—Fairly common around the coast.

GOLDEN PLOVER (*Charadrius plumialis*).—A few specimens are usually obtained every winter; they are, however, considered scarce.

GREY PLOVER (*Squatarola helvetica*).—Like the foregoing, the Grey Plover visits the island but sparingly.

LAPWING (*Vanellus vulgaris*).—Fairly common, principally between the months of January and April. Observed a large flock off St. Clement's Bay on March 18th, 1904.

TURNSTONE (*Streptilas interpres*).—Fairly common around the coast during the winter months.

OYSTERCATCHER (*Hæmatopus ostralegus*).—A few specimens are obtained every winter, but it is by no means common.

REDSHANK (*Totanus calidris*).—A few specimens usually obtained during the spring and summer months.

BAR-TAILED GODWIT (*Limosa lapponica*).—Only very few specimens are on record as having been taken on the island, and is considered rare.

BLACK-TAILED GODWIT (*L. belgica*).—A specimen of the Black-tailed Godwit was shot off Alderney on May 16th this year. So far as I can learn, this is the first record of its appearance in any of the Channel Islands.

CURLEW (*Numenius arquata*).—These birds are but sparsely distributed around the coast, and are more in evidence from January to March. Observed five birds flying very high, and in a south-westerly direction, on July 21st last.

WHIMBREL (*N. phæopus*).—Has been obtained occasionally during the spring months, but is considered rare. A specimen was shot on the island on May 19th this year.

COMMON TERN (*Sterna fluviatilis*).—Fairly common around the coast.

COMMON GULL (*Larus canus*).—Abundant all around the coast.

HERRING-GULL (*L. argentatus*).—Common.

KITTIWAKE-GULL (*Rissa tridactyla*).—Common.

GREAT BLACK-BACKED GULL (*Larus marinus*).—Scarce. Only one specimen on record, taken on March 9th, 1901.

RAZORBILL (*Alca torda*).—Obtained principally during the winter, sometimes in considerable numbers, the majority being immature specimens.

COMMON GUILLEMOT (*Uria troile*).—Found all round the coast, principally during stormy weather; during some winters these birds are exceptionally plentiful.

PUFFIN (*Fratercula arctica*).—Frequents the shore principally during the winter months, and breeds in considerable numbers on a small island off Alderney.

GREAT NORTHERN DIVER (*Colymbus glacialis*).—Obtained frequently during the winter months. A specimen was washed ashore in weak condition on March 16th this year near La Collette.

RED-NECKED GREBE (*Podiceps griseigena*).—There is only one record of the Red-necked Grebe having been taken in Jersey. This specimen is in Mr. Romeril's collection.

SLAVONIAN GREBE (*P. auritus*).—This species is frequently obtained in Jersey. Several specimens have been recorded during the past winter.

LITTLE GREBE (*P. fluviatilis*).—Fairly common in suitable localities throughout the island.

GANNET (*Sula bassana*).—These birds visit the shores of Jersey chiefly during severe winters. Specimens have been taken at intervals on various parts of the coast.

SHAG or GREEN CORMORANT (*Phalacrocorax graculus*).—Common all around the shore.

STORM-PETREL (*Procellaria pelagica*).—These birds, strange to say, are but seldom obtained around the shores of Jersey, although they nest in considerable numbers on a small island off Alderney. Two male specimens were forwarded to me from Alderney on May 14th this year.

NOTES AND QUERIES.

MAMMALIA.

White-beaked Dolphin (*Lagenorhynchus albirostris*) off Aberdeen. A specimen of this species, four feet long, was caught sixteen miles off Buchanness, July 23rd, 1904, and brought to Aberdeen Fish Market. On Aug. 18th following another was caught by trawl, from thirty to forty miles off Aberdeen. It measured, from beak straight to centre of tail, four feet, the breadth of tail being eleven inches. Nicolson, in his 'Manual,' p. 569, says: "Dolphins which are totally hairless when adult exhibit tufts of hair on the muzzle in the foetal state." This one, however, still retained a portion of this foetal appendage, there being some hairs on either side of the upper lip, each hair being three-quarters of an inch long, thus showing that the moustache continues for some time after birth; and, if we may judge from the condition of the teeth, none of which had cut the gums, although each was distinctly apparent, the conclusion must be arrived at that the creature was still solely dependent upon its mother for support. Altogether some fourteen or fifteen examples of this species have been recorded for the British and Irish seas. In the 'Proceedings' of the Royal Physical Society of Edinburgh, vol. x. p. 14, Sir W. Turner gives a good description of two that were caught off Stonehaven in 1888—one (a female) eight feet six inches long, and a young one, three feet eleven inches. He also gives a figure of the head of the young one, showing the position of the hairs on the upper lip, but he says nothing regarding the condition of the teeth.—Geo. SIM (Castle Street, Aberdeen).

AVES.

Fire-crested Wren (*Regulus ignicapillus*) in Lancashire: a Correction.—With reference to the note by Mr. J. Collins, Jun. (Zool. 1908, p. 455), of the capture of a specimen of the above-named species near Southport, may I be permitted to say that I made a critical examination of the specimen in question while it was temporarily placed in the Warrington Museum, and found it to be a brightly-marked male of the Common Goldcrest (*Regulus cristatus*, K. L. Koch).

I venture, therefore, to make the necessary correction. — R. NEWSTEAD (The Grosvenor Museum, Chester).

Unusual Nesting-site of the Nuthatch in Dorset.—A few miles from Beaminster, Dorset, a pair of Nuthatches (*Sitta casia*) attempted to breed during the season of 1904, in the open head of a rain-water pipe, which conveyed the water from the spouting under the eaves to the ground. As the nest would have inevitably been washed away by heavy rain, it was removed, in order that the birds might build elsewhere, and the head of the pipe covered with netting. During the process of removal it was found that eggs had already been laid. Although Nuthatches have been known to breed in nesting-boxes, I cannot recall an instance of their utilizing any part of a building as a nesting-site. The head of the pipe was some thirty feet from the ground.—FRANCIS C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

Swallows in Jersey.—In the first week of last September, Swallows increased considerably around Fort Regent and the vicinity; indeed, at no time during the summer had they been so numerous, and apparently they were congregating prior to their departure from our shores. On Sept. 4th large numbers were observed on the telegraph-wires, evidently resting. Amongst a number that settled on a stretch of wire which runs along the outer ramparts, and within a few yards of my observation-post, I noticed one specimen of a light buff colour, the back being a shade darker, while the chestnut colour on the throat and forehead showed but faintly; probably a young bird of the year. Swifts have been exceptionally numerous here this year, but they have evidently left us for another season, as none have been seen since Sept. 1st.—H. MACKAY (Jersey).

Hawfinch (*Coccothraustes vulgaris*) in Aberdeenshire.—An immature male was shot near Peterhead on July 19th last. The condition of its plumage would lead to the belief that it had been bred in the district. This is the first I have known to occur in the county. It is now in Peterhead Museum.—GEORGE SIM (Castle Street, Aberdeen).

Cuckoos near Aberdeen.—Cuckoos (*Cuculus canorus*) have proved very interesting this season, the old birds having been fairly numerous. I have no exact date when they absolutely left, which was probably some time in July, though I think I saw an old one in the middle of August. The young birds were very numerous—in fact all round this locality—so that the numbers were again up to the highest observed here. The youngest ones showed themselves very conspicuously during

wet days from Aug. 9th onwards. They appeared to be more or less troubled for food, and the foster-birds were kept busy supplying them. In one case I had some idea that two were depending on one pair of foster-birds, but I scarcely think this could be so, though there were three all beside each other, one being younger, or at least not so well grown as the other two; and this youngster had more whitish yellow on the breast than usual. They were numerous when I left for the British Association at Cambridge on Aug. 16th, but were away by the 30th, when I returned home, though one at least had only gone a day or two before, as it remained for a considerable time among the surroundings of the garden and neighbourhood. The Twites were again in all cases foster-parents.—W. WILSON (Alford, Aberdeen).

The Prey of the Long-eared Owl.—As two contributors to the July issue of 'The Zoologist' (*ante*, pp. 259 and 265) give evidence of this species preying upon other birds, I think, in justice to *Asio otus*, I must give the result of my examination of a number of pellets cast up by this Owl, which is common in this district. I have boiled down a large number of pellets containing remains of forty-four Mice, thirty Voles, and twenty insectivores. The remains of two Finches, apparently a Sparrow and a Greenfinch, are the only evidence I have of birds being taken. I have also examined scores of these Owls' nests, but have never found anything but Mice and Voles in the larder.—W. GYNGELL (Scarborough).

Short-eared Owl breeding near Scarborough.—On June 30th last I had two young Short-eared Owls (*Asio accipitrinus*) with down still attached to their feathers, and about six weeks old, brought to me by a farmer, who said he shot them on the moor, a few miles from Scarborough. I think this is the first known occurrence of this species breeding in this locality. Have your readers heard of it breeding before in Yorkshire? I have one of them preserved in my possession at the present time. Last autumn was quite remarkable for the large numbers arriving in this locality, and one day last April I saw eleven of them flying about in the same place.—JOHN MORLEY (27, King Street, Scarborough).

Boldness of the Common Buzzard.—During the past spring two correspondents have described to me striking and unusual instances of aggression upon the part of this ordinarily inoffensive bird when annoyed by intruders in the vicinity of its nest. Under such circumstances, as already stated (*ante*, p. 100), the bird usually soars or circles overhead, showing its agitation by its more active flight and

angry mewing cry. In one instance, which I observed this spring, a pair of Buzzards left their nest, which contained three eggs, as I approached it, and flew silently away till out of sight. On the other hand, certain individuals, which I believe to be older birds which have been much molested at the nest, become extremely bold in defence of their eggs or young. Such a case is described by the Rev. C. Wolley Dod in the 'Field' of July 2nd, 1887. A similar experience befell a friend of the writer's when climbing upon the rocks of Tyrau Mawr, a part of the Cader Idris range. But probably no one has had such full and repeated experience of these encounters as Mr. O. R. Owen, of Rhayader, whom I have to thank for the following details, and for permission to make use of them. It was in May, 1902, while Mr. Owen was crossing a stretch of moorland through deep heather, that he was suddenly startled as a large bird swooped past his head, then rose and hovered above him. The Buzzard followed him for at least half an hour, and repeated this manoeuvre time after time. With rapid glance downwards, or from side to side, it appeared to watch for an opportunity of taking Mr. Owen unawares; then followed a quick pounce or downward swoop, causing a rush of air as it swept past just above his head. Mr. Owen defended himself with his stick, and narrowly missed striking the bird many times. Forgetting the Buzzard for a moment, he was looking for a Ring-Ouzel's nest, when it came at him with such a sudden dash that he lost his hat, slipped, and fell. The attack was so fierce and persistent as to be almost bewildering, ceasing only when Mr. Owen was some three-quarters of a mile from the place where the bird commenced its onset. What renders the occurrence the more curious is the fact of its taking place upon the open moor, some distance from any suitable nesting-site.

The past spring has brought to the same observer a repetition of similar incidents, the aggressor being in each case a particularly bold and fearless individual, which Mr. Owen is inclined to identify with his assailant of two years since. Be that as it may, the bird is always recognizable, having lost a primary from one of his wings. On May 3rd, while climbing in an awkward place amongst the rocks, the bird made such a determined attack that Mr. Owen, not being able to spare a hand to defend himself, remained clinging to a small ash-tree for over an hour. The Buzzard came at him each time with legs held straight out, talons fully spread, beak sometimes widely open. Only with oncoming twilight did it cease its attack, thus releasing my friend from an awkward position. A fortnight later Mr. Owen visited the locality again, and thus describes his experience:—"The Buzzard was

in great fighting form, and made innumerable rushes at me, sometimes at the rate of three a minute. I hit it upon the wing twice as it passed by my head. Its talons were outstretched, and its beak wide open. Dashing past me at a great pace, it turned round many times, and darted at me from the opposite direction. At times it soared above my head, and would descend perpendicularly right at me with great force. It chased me for quite a mile." It will be noted that while on the former occasion the bird returned after each charge to its starting-point, and thence made a fresh dash, following the downward slope of the hill-side, this time, being in a particularly warlike mood, it made a series of return charges from the opposite direction.

Three nests were observed which had been more or less repaired or relined by this bird and its mate, but all were empty, and neither upon this nor any subsequent occasion were eggs or young found. The hen bird, when present, shared the anxiety of her mate, but never joined him in attacking the climber. Upon June 6th the Buzzard again defended his domains with all his wonted energy and pluck. I hope next year to hear more of this grand bird, which has already a fighting record sufficient to redeem his race from the charge of sloth and cowardice.

Curiously enough, the past nesting season produced another incident of the same character, for details of which I am indebted to two naturalist friends, Mr. A. Gwynne-Vaughan and the Rev. D. E. Owen. The scene is some twenty miles distant from that of the occurrences above described. The nest, which contained three newly-hatched young, was in a small birch-tree upon the open hill-side, and was of such easy access that a child of ten could easily have reached it. Mr. Gwynne-Vaughan writes:—"While we were looking at the nest the hen Buzzard attacked us. The first time that she swooped she came within two feet of our heads. The second time that she came at us Mr. Owen shouted, and put up his stick to keep her off. It was a fine sight to see her go up and away about half a mile, then come down with wings half-closed at lightning speed until within fifteen or twenty feet of us, when, in order to avoid striking us, she would pull up so suddenly as to throw herself right on to her back." One can easily fill in the picture: the outstretched legs and extended talons, the wild fierce eye, the angry and defiant mien—it would be difficult to find a more striking scene within the range of British ornithology. Mr. Gwynne-Vaughan adds:—"I have visited scores of Buzzards' nests, but have never seen an attack like this before." It is interesting to note, that in this last case the attack was, according to both my informants, made by the hen bird, and from the fact of the nest containing

newly-hatched young, this appears to be probable. On the other hand, Mr. O. R. Owen is confident that in the case of the Rhayader pair the male bird was invariably the aggressor. This is a point which we may hope to clear up definitely next spring. Lest it should appear that the Buzzards were unduly harassed, I may say that none of the gentlemen named had any wish to molest the birds, nor would they have taken eggs had they found them.—J. H. SALTER (University College, Aberystwyth).

Strange Accident to a Sparrow-Hawk.—Many times during over thirty-three years of shooting experience it has been my lot to witness fatal accidents amongst the birds, from the domestic tragedy of the tame Jackdaw drowned in the water-butt to the swiftly twisting Woodcock dashing himself against the bole of a beech-tree. The most frequent cause of calamity is the telegraph-wire to the Larks. In most of the cases which have come under my notice concussion has been the cause of death. Last year I found a fine cock Blackbird which had hung itself in a noose of neatly twisted woodbine, and on Aug. 26th last, while shooting on the confines of the Bog of Allen, in Co. Kildare, Ireland, I came across the following casualty :—Across a rather blind gap in a hedge bordering a plantation of firs was a tightly stretched strand of barbed wire, and an old cock Sparrow-Hawk (*Accipiter nisus*), in dashing through this gap, had just touched one of the groups of barbs with what I may describe as the elbow of his wing ; one of the sharp little spikes had pierced between the tough sinews and the bone, the impetus of flight had swung the bird over once round the wire, and there he hung till death overtook him. Having passed this gap late on the previous afternoon, and finding the bird on the following morning dead and stiff, seemed to prove that it died during the night, which was a singularly cold one for the time of year. The bird had lost a considerable amount of blood during his struggles, which had evidently been of a desperate character. In the 'Field' of Sept. 8rd or 10th I noticed an instance recorded of an accident happening to a Kestrel, so perhaps my observation may be of sufficient interest for record in 'The Zoologist.' — H. MARMADUKE LANGDALE (Compton House, Compton, Petersfield).

On Aug. 22nd, in Co. Kildare, Ireland, I captured a fine specimen of the *Convolvulus Hawk-moth* (female).—H. M. L.

Falco subbuteo and its Prey.—With regard to Mr. Corbin's account, in 'The Zoologist' (*ante*, p. 347), of the Hobby taking Bats, I may mention that on Sept. 17th, 1884, the gardener at Taverham Hall, Norwich, shot a Hobby, in the middle of the day, with a Bat in its

claws. The Bat was screaming, and so called the man's attention to the fact. I have the pair now in my collection.—JOS. F. GREEN (Bifrons, Canterbury).

'Peewit Swimming.—In 'The Zoologist' (*ante*, p. 849), I was interested in Mr. G. T. Rope's account of a young Lapwing swimming. This bird can swim right well, and is not at all averse to taking to the water when occasion requires it to do so. In the course of my winter's wildfowl shooting, whenever I shoot Lapwings near the water, if the winged birds cannot escape by land, they always take to the water, and often give me a long chase, when they swim away in all directions, and if a strong tide is flowing it is surprising how quickly they get away. I have also seen them take to the water when hard pressed by a Peregrine, and in one instance, after dropping to the water, the poor bird was taken up by the Hawk—a most unusual proceeding, for generally the Falcon appears baffled by the bird taking to the water, and, after circling round a few times, goes off in search of other prey. I remember one day, when standing on the shore here watching a splendid flight of a Peregrine at a Lapwing, that, after several times avoiding the stoop of the Falcon, the poor Lapwing was so exhausted that it dropped on the water, and swam ashore to where I was standing, and so terrified that it allowed me to take it up as soon as it reached the land. The Hawk "waited on" and swooped down when I held the Lapwing up, and followed me close as long as I held the Lapwing, but on letting it loose in some cover the Hawk went off.—ROBERT WARREN (Moyview, Ballina).

Grey Phalarope at Aberdeen.—A specimen of this rarity (*Phalaropus fulicarius*) was caught in Aberdeen Harbour, Dec. 8th, 1908, and is now in my possession.—GEORGE SIM (Castle Street, Aberdeen).

Little Gull and Ortolan in Norfolk.—On Sept. 10th my brother, R. B. Arnold, shot an immature Little Gull (*Larus minutus*) near Wells (Norfolk). The wind was west. It was a very darkly barred specimen. On Sept. 18th I got a female Ortolan (*Emberiza hortulana*) in the same locality. The wind was south-west, and there was a great influx of Linnets at the time.—E. C. ARNOLD (Blackwater House, Eastbourne College).

Ornithological Notes from Richmond and Neighbourhood.—The Great Crested Grebes I mentioned in a former note (*ante*, p. 198) were still on the Penn Ponds, with one young one, on Sept. 11th. Though not exactly in this neighbourhood, it may not be out of place to mention that I counted over thirty of these birds on the reservoir at

Staines on Sept. 18th. I also saw on the Penn Ponds a fine male Pochard on Sept. 2nd. I have found the Tawny Owl (*Syrnium aluco*) very common in Richmond Park, and anyone wishing to hear their loud "hoot" has only to wait at the park-gates on Richmond Hill any fine evening, though they call more, I think, when the moon is full. I obtained two specimens of this species from Teddington this year, and they seem distributed throughout the Thames Valley. I saw lately a fine adult specimen of the Long-eared Owl (*Asio otus*), killed in the neighbourhood. The last Cuckoo seen this year was a very fine female, on Aug. 20th, which was killed by flying against the telegraph-wires.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

Notes from Hunstanton, Norfolk.—During a short stay at Hunstanton, early in September, we saw several lots of Scoters, of which three were shot on one day, and seven on another. Wooden decoys, which some of the boatmen make very cleverly, are used to attract the birds, and at a little distance they look very much like the real article. Perhaps at this season the most interesting features of the local bird-life are the great flocks of Common Gulls, which assemble on the Mussel-scalps at low tide, and the long lines of Oystercatchers, which pass along shore at high water when the autumn spring-tides are at the full. When these birds are washed off their feeding-grounds off Wolferton they seek a temporary resting-place near Brancaster, flying about a quarter of a mile out to sea, and perhaps about two hundred yards above the water, in wavy black streaks clearly defined against the evening sky, which at Hunstanton is often marvellously beautiful. On Sept. 10th I watched for some time two Sandwich Terns not far from the pier, and on the 16th my son shot two young Curlew-Sandpipers and a couple of Wigeon. Turnstones were numerous, and we found them almost as good-eating as a Snipe.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

AMPHIBIA.

Edible Frog (*Rana esculenta*) in Surrey.—With reference to the note in 'The Zoologist' (*ante*, p. 852), I should like to put on record a few additional facts about the introduction of *Rana esculenta* into this county. About twenty years ago the late Lord Arthur Russell imported a number of these Frogs from Berlin, and turned them out in the neighbourhood of Shere. Most were put into a small pond, from which they made their way into Gomshall Marsh, where their

loud croaking excited some alarm and astonishment. In the year 1894 or 1895 we imported fifty more, again from Berlin, and these were put into a small artificially constructed pond in our garden here. Three or four of these still survive, and have spent ten years round the edge of the pond, plunging in when one approaches them. They are much more attached to the neighbourhood of water than our other species. They do not appear until May, long after the other Frogs have spawned and left the ponds. I have seen their spawn in our pond in June or July, and also tadpoles, which appeared to be those of *R. esculenta*; but I cannot say whether any reached maturity. If they did so, the young Frogs must have migrated. In the warm summer evenings these Frogs reward us with (to my mind) one of the most melodious concerts in nature. I did not know that they had extended their range to Ockham, which is at least six miles from Chilworth, with the North Downs between and a rather waterless country.—HAROLD RUSSELL (The Ridgeway, Shere, Guildford).

Natterjack Toad (*Bufo calamita*) in North Wales.—In the course of collecting materials for a fauna of North Wales, I have received from several correspondents records of the occurrence of the Natterjack in Denbighshire. Apparently it is confined to a belt of land stretching along the coast between the estuaries of the Conway and Clwyd Rivers, resorting in numbers to certain ponds during the breeding season. Whilst staying at Prestanyn in September, I obtained a specimen there among the sand-hills, and kept it alive for several days. I also found a dead one near the same spot. This shows that the species extends its range into Flintshire some miles east of the Clwyd. So far as is known, it occurs nowhere else in North Wales.—H. E. FORREST (Hillside, Bayston Hill, Shrewsbury).

Common Newt: does it occur in Carnarvon or Anglesey?—So far as I have been able to ascertain, all the small Newts in these counties belong to the Palmate species (*Molge palmata*), though the Great Crested (*M. cristata*) also occurs in Carnarvon. Any actual observations on this point will be very welcome.—H. E. FORREST (Hillside, Bayston Hill, Shrewsbury).

REPTILIA.

Some Habits of a Polynesian Lizard (*Lygosoma cyanurum*).—During my former voyage on the R.Y.S. 'Valhalla,' as naturalist to the Earl of Crawford (1902-8), we visited several island groups in the South Pacific. *Lygosoma cyanurum* was collected or observed in the following islands: Easter Island, Pitcairn, Tahiti, Tutuila and Upolu

(Samoa), and Viti Levu (Fiji). This species is exceedingly abundant in all the islands mentioned, and is most easily observed along the roadside, where it is usually to be seen climbing the flowering plants, and picking off the flies and small insects. In Tahiti I found an old and complete shell of a cocoanut on the ground, which, when handled, appeared to contain several Lizards. I stopped up the eye-holes, and took it on board for examination. I found it contained thirteen young Lizards, one hundred and thirty-six eggs, with the embryos in different stages of development, and also two hundred and ninety-four empty egg-shells. A few days later, in the same island, I found a hole in the ground containing several hundred newly-laid eggs. It would therefore appear that several females retire to the same spot to deposit their eggs.—M. J. NICOLL (10, Charles Road, St. Leonards-on-Sea).

PISCES.

Wolf-fish at Brighton.—While pier-fishing at Brighton on Oct. 5th, as the gale of that day was in "making," and a strong tide setting in, I caught a Wolf-fish (*Anarchichas lupus*), which may probably be not uncommon on this coast, but seems certainly unrecorded. Couch describes it as "among the rarest of fishes on the south of the British Islands," and gives Plymouth and Fowey in Cornwall as localities where specimens have been taken. Day refers to it as common along the Yorkshire coast; and it is recorded among the fishes of Yarmouth. It is not included in the list of fishes given in Mrs. Merrifield's 'Nat. Hist. of Brighton.'—W. L. DISTANT.

NOTICES OF NEW BOOKS.

Notes of an East Coast Naturalist. By ARTHUR H. PATTERSON.
Methuen & Co.

ARTHUR PATTERSON is the Thomas Edward of the Norfolk coast, or of that portion of it which adjoins the town so well known as Great Yarmouth. After a life of many struggles, with poverty for a neighbour, and long hours devoted to other pursuits than natural history for a living emolument, Patterson "comes out on top" as one of the recognized naturalists in a county where many lovers of nature abound. These remarks betray no confidence, but are prompted by the perusal of a biographical notice that accompanied the prospectus of his book, in noticing which the life of the author cannot be separated from the contents of the volume, and each is a valuable contribution to zoology. For it is of the greatest importance to the science to find that barriers of birth, circumstance, and culture can be successfully overcome, and that a man whose love of living creatures has been exercised at every spare moment in a strenuous existence, can make himself heard, and find means of giving his observations to the commonwealth of naturalists.

His contributions to zoology have been of two kinds: in technical local catalogues (several of which have appeared in these pages); and in bionomical observations, which form the contents of the volume under notice. In the first pursuit we are told that he has added over fifty species to the list of Great Yarmouth fishes, and twenty to the fish-fauna of East Anglia. With this remark we may conclude our personal appreciation, with a hope that the same energy displayed in observation may be supplemented by an equally sustained attack in the study of more abstruse principles in biology, when we shall expect to hear much—very much—more of this author.

Since 1891 Mr. Patterson has discarded the use of the gun, and substituted the employment of the field-glass, a very
Zool. 4th ser. vol. VIII., October, 1904.

excellent reform, desired by many more of us who yet find the old Adam of a too abiding nature.

To sail about Breydon Broad in a small house-boat is to be really alone with nature, and when the sun goes down, and the Yarmouth lights glare up in the distance, there comes a time for many cogitations. On such excursions the notes have been made which have provided the narrative for these pages, and we do not propose to sample too many, which would be unfair, as the book is published at a moderate price.

It is interesting to read that in this locality the Meadow-Pipit is the prevalent foster-parent of the young Cuckoo; to hear again of the old professional gunner, who with cast-iron—or rather gun-metal—constitution could sleep out on the coldest nights, and sell his best prey for prices which sound ridiculous to wealthy collectors of to-day; while the beautifully coloured illustrations, to those who know Breydon, faithfully recall the scene, and exhibit birds *in situ*, which all have not been so fortunate to observe. The fish-notes are informative and sometimes surprising. “In November, 1897, a Pike of goodly size was taken in a Herring-net miles out at sea, off Yarmouth. It was *reported* to be ‘strong alive’ when captured; that it was netted I am satisfied, for it was taken to a taxidermist for preservation as a novelty.” We may hope that Mr. Patterson will give annual fish-reports, and do for these somewhat neglected creatures what Mr. Gurney does so excellently for birds.

Notes on the Natural History of the Bell Rock. By J. M. CAMPBELL; with an Introduction by JAMES MURDOCH. Edinburgh: David Douglas.

MR. CAMPBELL, Assistant Lightkeeper, has shown in this small volume that he is a naturalist at heart, and has mastered the art of seizing opportunities. For a solitary lighthouse-keeper to remain sane, or, if with a companion, to refrain from realistic quarrelling under such lonesome circumstances, would to most men seem no inconsiderable achievement. Here we find detailed the various animal appearances during the year. The spring brings forth the legions of White Whelk from their

winter quarters in sheltered nooks and crannies where they have resisted the winter's gales, and they spread over the rock like a devastating army, devouring all animal matter they come across; while the badderlock, or henware, grows in profusion where the wash of the sea is most constant, and it has been seen to increase a foot in length during a period of six weeks. And so from month to month there is always something fresh to chronicle concerning the sea and its living creatures. In October we read of occasional visits by feathered migrants, but "each year sees a decrease in the number of arrivals" at this light-house, probably owing to the increased number of lights on other parts of the coast. The birds usually arrive in a "fagged" condition, and are easily captured. "A Kestrel landed on our balcony-railing during fog, and, despite the explosion of our fog-signals twenty feet overhead, tucked his head under his wing and fell sound asleep." Sometimes we meet with strange conclusions, and these need not be too lightly dismissed. Thus Mr. Campbell writes:—"When fish show an unusual tenacity of life, that is, after being gutted and cleaned, exhibit strong muscular action for some time after, this phenomenon invariably precedes a change of some kind in the weather, usually more wind or heavier sea. This at least is my experience from several years' observations."

Frequent reference is made to one species of fish—the "Poddley"—which by that name alone may be unrecognized by some readers. We are always interested in this fish; it was the first sea-fish we captured in the days of our boyhood on the coast of Fife, where young fish are exceedingly plentiful; and when meeting Fifeshire men—sometimes irreverently called "Whistlers"—abroad, we have invariably tested their knowledge of local names by asking them if they knew what a "Poddley" was. As a rule, they did not know! Recognized by Couch as the "Podley," by Day as "Podlie" and "Podling," it is the well-known *Gadus virens*, or Coalfish.

When an "Assistant Lightkeeper" can observe and record his observations, as detailed in this small volume, we may well regret the immense loss of unrecorded natural history observation that yearly dies with fishermen, marshmen, birdcatchers, poachers, gamekeepers, and other men of no "light or leading."

Natural History Essays. By GRAHAM RENSHAW, M.B., F.Z.S.
Sherratt & Hughes.

MOST readers of 'The Zoologist' are familiar with the name of Dr. Renshaw, who has contributed several papers on rare mammals and birds to its pages. These and others are now included in an amply illustrated volume entitled 'Natural History Essays,' which altogether relate to African mammals, numbering sixteen in all. We apply the word African, and not the term Ethiopian, to these animals, as some of them are found in the northern part of the continent which is included in the Palæ-arctic region.

A strong feature in these essays exists in the full information as regards the number of specimens—and their present museum location, of several very scarce, and at least two extinct species; while Mr. Renshaw has compiled very much information regarding their habits from the pages of old African travellers. These obituary notices of the Quagga and the Blaauwbok are now very sad and prophetic reading to those who have recently visited the plains of Southern Africa, and have noticed the immense diminution of the once enormous mammalian fauna. A few years ago an old Africander visited Pretoria, and pointed out a spot in the centre of the town where he had once killed a Lioness; whilst in the environs of that city a Boer farmer has told us how Lions used to visit his lonely farm, and pointed to the spots they used to frequent. All that is altered; the wild game is only found where the shaft has not been sunk; the Antelopes have almost disappeared, for the Boers found a market for their skins; Lions have restricted their range; and the Rand millionaire is now the lord of an auriferous land.

To those who wish the story of some of these animals well told, we commend this small volume.

Superstitions about Animals. By FRANK GIBSON. The Walter Scott Publishing Co., Ltd.

THE subject-matter of this book is open to a different conception and treatment to that pursued by Mr. Gibson. It might have been entitled "Animal Folk-lore," and its origins searched for in the cults of primitive folk. The author has, however,

chosen to treat these "survivals" as superstitions, and to trace their appearance and quotations in the lines of poets and other distinguished writers—mostly British. He has thus produced a most interesting anthology, which bears the impress of a familiar acquaintance with most of our well-known poets and biblical writers. He has carefully compiled most of those weird and curious notions which have principally become attached to birds, and has traced them throughout much literature, but he has not dealt with their origins, which the growing study of folk-lore can alone reveal. What we call superstitions are most frequently only survivals of events and ideas from a dim past, which have come down to us in the stage of myth, and already much has been traced in animal folk-lore which has evidently not yet come under the purview of Mr. Gibson, who approaches the problem from another standpoint. He asks:—"How came legends and omens and monstrosities into existence? Did they arise from men's sinfulness and fear, or were they the outcome of fertile imaginations desirous of adding to the wonders of Creation?" There is in this subject a distinct opportunity for a great book, which might prove a companion volume to the well-known 'Wanderings of Plants and Animals from their First Home,' by Hehn and Stallybrass. Mr. Gibson has produced an interesting volume, but he should not refer to Figuiet as "the celebrated naturalist."

A Book of the Snipe. By "SCOLOPAX." Blackwood & Sons.

A PERUSAL of this little book will prove to any reader that it is possible to find the sportsman and naturalist combined in one individual. Snipe-shooting to the writer of this notice is now only a memory, and was confined to rice and old cane fields in the Malay Peninsula, where the birds could in season be found abundantly, and under a tropical sun; "Scolopax" deals with the bird as found in these islands, often in bog-lands, under a wintry sky, and frequently requiring much finding. Although to most of our readers the Snipe and not the gun will be the chosen subject-matter, the little volume should be read from end to end, for the author is both a sportsman among field naturalists, and a field naturalist among sportsmen, and we come across hints and

observations where least expected. Thus we know that most animals seek to escape danger by concealment, and endeavour to reach an environment which provides some amount of assimilative coloration. According to "Scolopax," this may be the last living effort of the Snipe. "I think it is pretty certain that a Snipe not killed outright, yet *in extremis*, always looks out for a secure hiding-place in which to drop, even though it may die before reaching the ground, a fact that may account for the wonderful concealment of many dead birds. I can only say that I have witnessed birds falling with a bump, perfectly dead, into the only patch of cover available for a long distance, too often for the circumstance to be merely the result of chance."

The author remarks that he is positive, without being able to prove it, that he saw a Snipe fly across the crowded road which leads from Hammersmith Bridge to Barnes Common in January of this year. We have had recent records of the bird nesting in Romney Marsh (Zool. 1897, p. 271), and on Epsom Common (Zool. 1899, p. 225), and it has been reported as an uncommon winter visitor to the metropolis itself; but, as "Scolopax" remarks, "It is not unlikely that the glare of a city seen from the heights above by the travelling birds may actually attract them to a nearer inspection."

EDITORIAL GLEANINGS.

THE Rev. J. Cartmel Robinson has recently contributed to the 'Daily Chronicle' on the question of "Do Animals think?" Among other remarks we cull the following :—

"It has often astonished me that comparative psychology has not been studied to greater advantage, for no one who really loves animals and observes them attentively can fail to see how much we have in common. That the mental process in animals and men is identical, I am not prepared to say, but if there be a difference it seems to be one of degree rather than of kind.

"If the theory of Descartes be true, that animals are merely automata, then all I can say is that I have been imposed on all the days of my life by appearances. Tiglath Pileser, the Goat, Ragnar, the Raven, Paddy, the Dog, Billy, the Tortoise, Uncle, the Toad, and a hundred others have only been so many cunning simulations of thinking beings. You shade of Æsop and Romanes; you Michelet and Seton-Thompson, and Uncle Remus, you are all wrong; animals only appear to think. Man, after all, has the exclusive monopoly!"

He gives an interesting account of a Goose he had under observation :—

"His home was on a farm in 'Jefferies land'—that Jefferies who knew so much about animals, and yet did not seem to love them as some men have done. He was then about four weeks old—a solitary gosling, awkward in manner, and with the dull plumage of a young bird. By solitary I mean that he had no companions among his own kind. But he had escaped the spirit of isolation by adopting a large brood of ducklings even younger than himself. For them he seemed to live, and I verily believe, by the tremendous combats in which I saw him engaged on their behalf, that for them he would willingly have died.

"In the evening when they were fed he marched the whole brood up to the dish, and perambulated the outside of the circle, fighting all intruders, until the meal was finished. Cocks and hens, Ducks and Geese, even the majestic Peacock, respected his office. If one of them so much as dared to draw near he was instantly attacked, and

with such fury, by the gosling, that he fled precipitately. During all this time he got nothing for himself, and frequently squatted on the ground from sheer exhaustion. When they were all surfeited he led them off like an earl marshal to the brook for a drink ; and then, with the setting of the sun, dutifully brought them back to their pen, where they were safely housed from marauding Foxes.

“ People apply such epithets as ‘divine charity’ and ‘enlightened self-interest’ to the same ethical action. But when we differentiate, and call that reason in man which is only instinct in a Dog, I would ask seriously what is meant. Is it a qualitative or a quantitative difference? For instance, what does Jefferies mean when he says, ‘There is nothing human in any living animal’? Such words are unintelligible to me. Depend on it, the more we realize the unity of creation, and especially the correlation of all living things, the better it will be for the world.”

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OBSERVATIONS IN NATURAL HISTORY MADE DURING THE VOYAGE ROUND THE WORLD OF THE R.Y.S. 'VALHALLA,' 1902-3.

By MICHAEL J. NICOLL, M.B.O.U., Naturalist to the Expedition.

IN the autumn of 1902 the Earl of Crawford, F.R.S., most kindly invited me to accompany him, as naturalist, during his winter cruise round the world in his yacht 'Valhalla.' The collections made in various branches of natural history were all presented by him to the British Museum. An account which I wrote of the birds collected during this trip was published in the 'Ibis' (January, 1904, p. 32).

In the present paper I intend to give a short account of the most interesting of the places visited, as well as "field notes" on the birds, mammals, insects, &c.

We left Cowes on Nov. 19th, 1902, for Lisbon. Numbers of birds were of course seen, Shearwaters (*Puffinus gravis*) being especially numerous, while frequently a Skua (*Stercorarius pomatorhinus*) would dash amongst the Kittiwakes, which were following the ship, and cause them to disgorge the morsels of food which they had picked up. When we neared the coast of Portugal, Gannets (*Sula bassana*) and Little Auks (*Mergulus alle*) became abundant.

After spending two days at Lisbon, we sailed for Madeira on Nov. 26th. On landing at Madeira, one of the most noticeable

sights to the naturalist is the quantity of Lizards (*Lacerta dugesii*). These Lizards are to be seen all over the walls by the roadside. During a walk in the country behind Funchal, I obtained several handsome Spiders (*Argyope trifasciata*). The natural history of Madeira has been so well worked, and has been written about so often, that a long account in this paper would be of little interest.

After leaving Madeira, we touched Las Palmas (Gran Canaria), and St. Vincent, Cape Verdes. On Dec. 12th we left the Cape Verde Islands for St. Paul's Rocks. Five days later we sighted this lonely group of barren rocks, which are situated in mid-Atlantic. St. Paul's Rocks are little more than half a mile in circumference, and the highest point is sixty-four feet above sea-level; they are very seldom visited, except when a ship sights them for the purpose of ascertaining her exact position. Consequently the three species of birds which inhabit them, and breed there all the year round, are very tame. The most abundant bird is a common tropical Gannet (*Sula leucogastra*), the other two species being Noddy Terns (*Anous stolidus* and *Micranous leucocapillus*). The Gannets are so tame and fearless of man that we had to push them off their nests in order to climb the rocks, as to walk amongst them with unprotected legs whilst they are sitting is a painful undertaking; the old and even the young birds bite savagely at one's legs. Besides the birds, these rocks are inhabited by swarms of curious-looking red and green Crabs (*Grapsus strigosus*), which were crawling in thousands all over the rocks, and feeding on remnants of flying fishes which the Gannets had brought to their nests as food for the young. A small cricket is fairly numerous, and a tiny beetle and a feather-feeding moth were also obtained. The sea round St. Paul's Rocks swarms with Sharks, and more than twenty were caught from the ship during our few hours' visit. Numbers of fish were caught by our party from the rocks; a species of Cavalli, a Wrasse, and the curious Trigger-fish (*Ballistes* sp.).

After spending a few hours ashore on St. Paul's Rocks, we sailed for the Brazilian convict island, Fernando Noronha. During our visit there were about two hundred and seventy convicts on the island, but they are now no longer sent there. They were all murderers, but from what we saw, I should say

there are worse places for a convicted murderer than Fernando Noronha. Each man has his own cottage and garden, and has only to do three hours' work a day for the State; the rest of the time they work in their gardens, though all have to attend a roll-call at sunset, when a bugle is blown. Previous to our visit, I believe, only one other naturalist had visited this island; this was Dr. H. N. Ridley. The 'Challenger' touched there in 1873, but were not permitted to collect. Dr. Ridley, however, had worked the island pretty thoroughly, and two species of birds which he obtained were described as new, i. e. *Vireo gracilirostris* and *Elainea ridleyana*. I therefore obtained no novelties, but I met with all the birds obtained by him. There are only three species of land-birds, they being the two species already mentioned, and a small Dove (*Zenaida ariculata*). This latter bird is not peculiar to Fernando Noronha, as the two former species are, but is found also in South America. It is very abundant, and is to be met with all over the island, sometimes in large flocks. Maize is grown in some quantities on this island, as well as a few bananas. The natives, with great dexterity, use catamarans, i. e. rafts made of three logs lashed together side by side, with a small seat at one end. Several of the convicts, to show us, went through the rough surf, propelling their catamarans with a single paddle. There is always a surf breaking on the shore, and we never landed or went off without getting wet. The only mammals on this island are imported Rats (*Mus rattus*) and Mice. I saw several small blue butterflies, but obtained none of them.

There are two species of Lizards on Fernando Noronha, but I only met with and obtained one of them, *Mabuia punctatq*. This Lizard seems to be very abundant on the island, but very quick and agile. I saw numbers basking on the dry sandy ground amongst some small fig-trees. Opposite our anchorage there was a very large "blow-hole" in the rocks, through which every few minutes the sea drove the air with a loud rumble. We sailed for Bahia, Brazil, on Dec. 22nd.

Christmas Day was spent within sight of the low-lying coast of Brazil, and the tropical heat was very unlike Christmas weather.

Bahia is a very fine-looking town from the harbour, but on

landing one finds the streets narrow and dirty ; so that it is a relief to get away from the town and into the magnificent tropical forests. In these forests one sees gorgeous birds and butterflies, and I here met with my first Humming-birds. The most abundant species of Humming-bird is *Chrysolampis moschitus*, although the handsome long-tailed *Eupetomena macrura* is also common. These two birds may be seen together in plenty round the big flowering plants and trees ; their flight is exceedingly rapid, and whilst they are hovering over the blossoms their wings are moved with such extraordinary rapidity that they produce the loud humming, from which these birds have got their name. About the streets in the town one meets with a little bird somewhat resembling our Wheatear in its actions, although it is paler in colour. This is *Fluvicola climacura*, called by the natives "Washerwoman." It is a great favourite with the natives, and is consequently very tame. In the open glades in the forest we met with many birds, Tyrant Flycatchers being perhaps the most abundant, and from the tops of the tall trees the loud cry of *Tyrannus melancholicus* is continually heard. Woodpeckers are very numerous, and the beautiful Red Tanager (*Rhamphocelus brasilius*) is constantly met with near the glades and edges of the forest. In these open grassy tracts one sees narrow pathways, where the grass has been completely worn away by the continual passing and re-passing of the Umbrella Ants. It is soon seen why these ants have got this trivial name applied to them, as they carry large pieces of leaves in their mouths, with which they completely conceal themselves. On Jan. 5th we left Bahia for Monte Video.

Most of the time we were in the tropics we of course saw numbers of Flying Fishes. I believe there is considerable diversity of opinion as to whether Flying Fish move their wings or not during their flight. I spent a great deal of time watching them, and am fully convinced that they do move their wings, but with such a rapid shivering movement that it is almost imperceptible. I caught one Flying Fish (*Exocoetus evolans*), which had flown on board. I at once placed it in a large bath of seawater, to see what use, if any, it made of its wings (I call them wings now for simplicity's sake) when in the water. It appeared that while the fish was swimming it kept them pressed close to

its sides, and made no use at all of them as fins. It also seemed unable to turn quickly, but could only do so by taking a fairly large circle. Flying Fish seem able to alter their course while in the air. I watched many taking long flights, and turning in several directions without touching the water ; I presume this is done by bending the tail to one side.

On Jan. 14th we anchored at Monte Video, where we stayed a day or two to "coal." I spent some time fishing from the ship. Two species of fish only were caught—one a common Catfish, but the other (a *Corvina*) proved to be an undescribed species. It has since been named *Corvina crawfordi*, after the Earl of Crawford. The largest fish of this species which I caught was about three-quarters of a pound in weight the bait used being a piece of raw veal. In the harbour at Monte Video I had a good view one evening of *Cygnus nigricollis*, the Black-necked Swan, two of which flew over the harbour.

On Jan. 20th we took on our pilot for the Straits of Magellan, and left Monte Video for Punta Arenas.

The first Albatross (*Diomedea exulans*) was seen the day before we got to Monte Video. After we left there for the Straits of Magellan we saw some numbers of these birds, as well as *D. chlororhynchus*.

On Jan. 27th I saw two species of birds which were of special interest to me, i.e. Diving Petrels (*Pelecanoides urinatrix*) and Penguins (*Spheniscus magellanicus*). The Diving Petrels were seen nearly the whole day rising from under the ship's bows, flying away with a feeble fluttering flight, and dropping with a splash into the water fifty yards or so from the ship, when they immediately dived. Later on, when we were in the Straits, and I was able to shoot a few of these curious little birds, I noticed that they rarely took to the wing when pursued, but sought safety by diving. The Penguins have a curious habit of lying on their side in the water with one leg out, and drifting with the wind or current. I shall never forget skinning the first Penguin. The inner surface of the skin is covered with quite an inch of oily fat, and the quills of the feathers extend backward through this coating of fat, consequently making it very difficult to remove.

On Jan. 29th we passed through the first and second narrows.

In these narrows in the Straits of Magellan there were quantities of sea-birds: Terns (*Sterna hirundinacea*), Skuas (*Megalestris chilensis*), Penguins (*Spheniscus magellanicus*), Albatrosses (*Diomedea exulans* and *D. chlororhynchus*), as well as Diving Petrels. At about midday we arrived at Punta Arenas, the only town in the "Straits." It is a curious-looking town, many of the houses having tin roofs. Punta Arenas is situated on the low-lying ground close to the sea; behind the town the hills rise up, clothed to their summits with beech-forests. In the Magellan Straits there are two species of beech-trees, *Fagus antarctica*, which is deciduous, and *F. betuloides*, which is an evergreen. The forests round Punta Arenas are chiefly composed of the former. When approaching Punta Arenas from the east end of the Straits, as we did, the first of the country seen is entirely bare and sandy. In this part of the Straits we saw the curious Huanaco (*Lama huanacos*). When the town is reached, however, the country entirely changes; thick forests and high mountains take the place of flat sandy country, and this thickly wooded country continues to Chile. During our stay at Punta Arenas the forest behind the town was on fire; we were told that this fire had been burning for a month. A coal-mine had just been opened, and we paid a visit to it, in company with the governor of the town. I went down the mine; there was no deep shaft, but simply a tunnel bored in the side of the hill, through which a line is laid, and we went into the interior of the mine on a truck. Outside the entrance to the mine, at an altitude of 1000 ft. above sea-level, I found a large mass of soft rock, in which numbers of large Oysters were imbedded. I managed to dig out a complete specimen. In the forests and in the open country round Punta Arenas I saw very few birds, the most abundant species being a small Chat (*Centrites niger*), which I found fairly abundantly along the shore. I also met with the curious "Quail Snipe" (*Thinocorys rumicivorus*); this little wading bird, which has the habits and appearance of a Sandpiper, has the bill of a Quail or Partridge.

On Feb. 3rd we left Punta Arenas. Ships going through the Straits of Magellan have to anchor every night, so we had several opportunities for collecting. All the way through the Straits there are numbers of natural harbours, and every afternoon we

anchored in one of them. The beauty of one's surroundings in these anchorages is almost impossible to describe; towering hills on every side, covered to their highest peaks with dense forests, which are almost impenetrable; the water like glass, and of an inky blackness; little islands dotted around, and covered with flowering shrubs, fuchsias, &c., form a scene of such magnificent beauty that I shall never forget the time spent in the Straits of Magellan.

After leaving the Magellan Straits we passed through Smythe's Channel, through the last narrows, and out into the stormy waters of the Gulf of Peñas. During our passage through Smythe's Channel we came across several parties of the now comparatively scarce Fuegian Indians. These stunted and hideously ugly people travel about in canoes from island to island in the Straits; they wear comparatively little clothing—a few Otter skins only—and live almost entirely on Mussels (*Mytilus magellanicus*). When travelling they always have a wood fire burning in their boat. We came across several deserted camps of these Indians.

No account of the Straits of Magellan would be complete without a mention made of the "Steamer Duck" (*Tachyeres cinereus*). This curious Duck is, I am afraid, not nearly so abundant as it was formerly; at least, so I was told by our pilot and others, and, although we saw plenty of them, there were not the large numbers as described by Prof. Cunningham ('Natural History of the Straits of Magellan'). There has been considerable controversy as to whether there are two species of "Steamers" or not. It is said that one species is able to fly, while the other is not. I myself never saw a bird of this species fly, although I pursued numbers. They seem to run on the surface of the water, flapping their tiny wings. One of our party, however, saw one of these Ducks fly, and he was close enough to clearly identify it. For my own part, I believe that there is one species only, and that the assertion made by some authors—*viz.* that the birds of the year are able to fly, but as they get older they lose the power to do so—is correct, and my experience seems to convince me of this; that is to say, that during our visit, early in February, the old birds were nearly always accompanied by *down* birds, or young birds not fully fledged,

and which had not then grown their wing-feathers; so that the only birds we saw (with the one exception mentioned above) were old birds incapable of flight, and young birds with featherless wings. The pace these birds manage to go across the water, flapping their wings and running on the water, is so great that we found it impossible to catch them up with a six-oared boat, try how we would.

A common bird in these Straits is *Phalacrocorax atriceps*, a very handsome white-breasted Cormorant, while a smaller bird of the same genus (*P. magellanicus*) is also met with in considerable numbers.

In the thick forests along the shores of Smythe's Channel very few land-birds were seen. Occasionally the plaintive whistle of *Elainea albiceps* is heard. In our last anchorage (Gray's Harbour) I met with a most curious Wren-like bird with an enormously long tail composed of four feathers; this was *Sylviorthorhynchus demursi*.

During our passage through the Magellan Straits and Smythe's Channel, I only once saw a Bat. Another interesting mammal met with was the Otter (*Lutra patagonicus*), of which species I shot one example.

After passing through the Gulf of Peñas, we passed up, out of sight of the coast of Chile, and dropped anchor off Valparaiso on Feb. 14th. In the Bay of Valparaiso I obtained a fair collection of sea-birds, but land-birds were very scarce outside the town. Several insects were obtained, and amongst these one specimen of a very rare species of Micro-Lepidoptera (*Helio-stibes mathewi*). This species was hitherto known only from a single example.

After being docked for cleaning, and having taken on a supply of coal, we sailed from Valparaiso on Feb. 24th, bound for the islands of the South Pacific. After fourteen days' sailing with a fair wind we sighted Easter Island on March 10th. Owing to a very high wind, however, we were unable to land for two days. We steamed up and down under shelter of the island, when, with a strong glass, we could distinctly see the huge stone images for which Easter Island is famous. When this island was first discovered it was entirely uninhabited, the only signs of inhabitants being the stone images, which are cut out of solid

blocks of lava in the shape of a human head and part of the body. Some of these figures, which are about thirty feet in height, are placed in a standing position, facing the sea, on the sides of one of the smaller craters, while others are placed at intervals along the shore. Why these figures are there is unknown, but, as Easter Island has never been properly "worked," this is not surprising. Except for mention of some caves in the largest crater, which I shall try and describe later, I have been unable to find any account of the mystery of Easter Island. During our short visit we found a human skull lying near one of the images, and on questioning a native (Easter Island is now used by a Chilian company as a sheep and cattle run, and Polynesians have been introduced to work there), we were told that



Crania found at Easter Island.

there were quantities of human bones under the statues, or rather among the large blocks of lava on which many of the images are standing. We at once set the natives to work to collect some of these bones, and in a short time we got about a dozen skulls and many other bones, nearly all of which appeared to be of great age, and in many instances were crumbling away.

My illustration shows the facial part of two of these skulls, which I photographed. These bones are now being worked out at the British Museum, but I have not yet heard the result; they undoubtedly belong to the race which formerly inhabited Easter Island, and, according to measurement made by the doctor on

board and myself, they were a small race of people, possibly little over five feet in height, and very different to the tall stalwart Polynesians. The present natives on the island knew nothing about these bones, except that they were there when the ranchers arrived. In the crater of Rana Kao, the highest point of which is 1200 ft. above the sea, are several caves, in each of which there are curious carvings, which were described to me by some of our party (I did not have time to see them myself, as we were only eight hours on shore) as resembling mermaids, or figures like mermaids, and the "rising sun." We were also told that there was some writing carved on both wood and rock on the island, but no one could tell us where it was. If only a proper investigation could be made of Easter Island many other curious things would be sure to come to light, and help us to understand more about the undoubtedly clever race of people now so long extinct, who formerly lived there. After all, Easter Island is not so difficult to get to. A boat visits it twice a year from Valparaiso. Birds are very scarce on Easter Island. There is one land-bird,* which I did not meet with, and a Tinamou (*Nothoprocta perdicaria*) has been introduced from Chile. In the crater of the extinct volcano I saw a few White Terns (*Gygis candida*), and several Geese, some black with a white patch on the wing, and others reddish in colour; but I do not know to what species they belong.

Easter Island is almost entirely covered with grass, there being no trees or bushes except around the houses at the settlement. At the time of our visit we were told that there were about forty thousand Sheep on the island, as well as many Horses and cattle.

On March 22nd, early in the morning, we sighted Pitcairn Island, the home of the descendants of the mutineers of the 'Bounty.' It was a most gorgeous day, and a sea like glass. As we neared the island a few Flying Fishes rose under our bows, while every now and then a Red-tailed Tropic Bird (*Phaethon rubricauda*) flew past us. We anchored in Bounty Bay, close to the settlement. A boat-load of the islanders at once put off to us with fruit, &c. They were very anxious to obtain some shot-cartridges to kill some of their fowls, which are allowed to run wild over the island, and consequently become

* Possibly unknown to science.

very shy. There is always a heavy surf along the shore, and, as landing is very difficult in an ordinary boat, we went ashore in one of the Pitcairn surf-boats. The islanders are exceedingly skilful in using these boats, and they ran us up into a little sheltered bay through a surf that must have swamped any ordinary boat.

I soon started off into the island collecting, and in less than a day I went over nearly the whole of Pitcairn. The roads or paths are well kept, and a supply of fresh water runs down from the top of the island through pipes to the settlement. Banana-trees grow in profusion over most parts of the island. The highest point is about 1000 ft. above sea-level.

There is only one species of land-bird, which is, however, abundant. It was described as a new species two years before our visit, from specimens brought home by Lieut. Vaughan, of H.M.S. 'Duke of Wellington,' and was named after its discoverer by Dr. Bowdler Sharpe. This bird (*Tatara vaughani*) has been figured by Mr. Keulemans in my paper on the birds collected ('Ibis,' January, 1904, plate 1). Until our visit the plumage of the young bird, which differs considerably from the adult, was unknown.

There are several species of sea-birds at Pitcairn. Gannets (*Sula piscator*), the Tropic Bird previously mentioned, Noddy-Terns (*Anous stolidus*), and White Terns (*Gygis candida*). There is also a large Shearwater (*Puffinus* sp.), which I saw in some numbers flying at some distance from the island. There are some Rats on the island, but I was not able to get one. It is probably *Mus rattus*, which has been brought by ships, very possibly by the 'Bounty' itself. There is a Lizard (*Lygosoma cyanurum*), which is very abundant. I caught a few Micro-Lepidoptera, amongst which *Plutella maculipennis* was the most noteworthy. From a water-butt we took some larvæ of Mosquitoes, which, when reared, proved to be *Stegomyia fasciata*. After spending a day and a half at Pitcairn, we left, on March 23rd, for Tahiti.

During our passage to Tahiti we passed several tree-trunks and many cocoanuts floating on the water. These were undoubtedly some of the trees carried away during the fearful hurricane in the Pamoutu Islands, which are the low coral

islands and atolls of the Society group. This hurricane occurred a few months before our visit.

On March 28th, in lat. $23^{\circ} 20' 28''$ S., long. $142^{\circ} 58' 28''$ W., a large Shark was caught, off which I took a Sucking Fish (*Echeneis remora*). These Sucking Fish were seen swimming round the Shark in some numbers. When we got it on board I held this Sucker to my hand; it immediately fastened itself on, and held firmly.

On March 30th the beautiful island of Tahiti was sighted, and early next morning we were piloted through the reef which surrounds the island, and anchored off Papeete. Tahiti is probably the most beautiful of the many beautiful islands of the South Pacific. It rises to a great height from the sea, and is entirely covered with thick forests. During our stay at Tahiti we visited Tautira, a small picturesque village some miles from Papeete along the coast. During this passage we had a fine view of the coast, when some of the deep gorges and waterfalls were seen to advantage. From Papeete one has a good view of the neighbouring island of Eimeo, about twelve miles or so distant. A curious feature of this island is observable on a clear day, and this is a large hole completely through one of the jagged peaks which crown the top of this island. Several visits were made to the Barrier reef, where, owing to the glass-like clearness and stillness of the water, the brilliantly-coloured fish which inhabit the coral-reef were easily observable.

Sea-birds were not at all abundant; the only species noticed were Frigate Birds (*Fregata aquila*), White Terns (*Gygis candida*), and Tropic Birds (*Phaethon* sp.?). Land-birds seemed equally scarce, but all birds are protected, and we were unable to collect. Two species of butterflies were taken, as well as several Micro-Lepidoptera; amongst the latter, *Pyroderces crawfordi* has lately been described by Lord Walsingham as new to science. During the voyage I always found that numbers of these insects could be taken while sitting on or flying round the "after" light on the poop. Everywhere on the low ground and swamps near the shore the burrows of Land-Crabs are seen, but their inhabitants are very knowing and difficult to capture. Terrestrial Hermit-Crabs are also very abundant, and crawl up to some height on the trees and shrubs.

On April 17th we left Tahiti for Tutuila Island, one of the Samoan group. Five days later we anchored in Pago-Pago Harbour. The harbour of Pago-Pago, or Pango-Pango, as it is pronounced, is one of the most, if not the most, sheltered harbour in the South Pacific Islands; situated almost in the middle of the island, and about two miles in length from the sea, it is completely sheltered by high hills on each side. These hills, like all those in these South Sea Islands, are thickly wooded, and in these woods I found plenty of birds. By far the most abundant species of birds in Tutuila is *Ptilotis carunculata*, whose loud note is continually heard. *Aplonis atrifusca* is likewise common, and reminds one of our Blackbird in its habits. The beautiful little Scarlet and Black Honeysucker (*Myzomela nigri-ventris*) is also frequently seen in the tops of the cocoanut-trees. Towards evening large Fruit Bats (*Pteropus fuscicollis*) come down in numbers from the hills to the back of the town, where they may be observed flying round the cocoanut-trees. Two species of Mosquitoes were obtained (*Stegomyia fasciata* and *S. scutellaris*).

On April 24th we left Tutuila for Upolu, another of the Samoan Islands. The same evening we anchored off Apia, the chief town of Upolu. During the three days spent at Apia, I made two excursions, collecting. One day I walked along the shore about eight miles beyond the town. Here I met with examples of *Totanus incanous*, a large Sandpiper, whose eggs are as yet unknown; here also I saw large flocks of the Eastern Golden Plover (*Charadrius fulvus*), numbers of which were in nearly full breeding plumage. A small Heron (*Demigretta sacra*) is also common on Upolu. In its immature stage this bird is snowy white, becoming blue-grey as it nears maturity. The next day I went inland, where, at a height of 1000 ft., I procured specimens of a beautiful Fruit Dove (*Ptilopus fasciatus*). This small Dove, which is no larger than our Turtle-Dove, was feeding on the seeds of a tall tree; each seed, which was larger than an olive, was swallowed entire. The Fruit Bat (*Pteropus fuscicollis*) was fairly numerous; I shot one as it was hanging from a branch over the road. I saw one of these Fruit Bats flying about with a young one clinging to it, but was unable to obtain it.

In the Samoan Islands I watched several natives fly-fishing in the surf on the Barrier reef. A long bamboo is used as a rod, at the top of which a line is fastened; at the end of the line a piece of stick is tied crosswise, and from each end of this stick a black-feather fly is attached by a piece of line about six inches long above the hook. They seem to be very successful with this fishing. Fish are also taken in wicker-baskets set in the coral-reefs.

On April 29th we left Samoa for Fiji, where we anchored at Suva. A great mistake has been made in some of the Fiji Islands by the introduction of the Mongoose. This animal was introduced to destroy the Rats, but of course it soon either tired of or killed the Rats, and is now an intolerable nuisance, as it kills the chickens and even young Pigs, especially near the town of Suva, where it swarms. It is also probably destroying many of the ground-building birds, as it is doing in the West Indies. A Myna has also been introduced, but whether it is doing harm or not I cannot say, as I had no opportunity of observing it. A fairly common bird near Suva is *Pachycephala graeffei*, a fine Golden-breasted Bush-Shrike. Owing to the thick foliage I found it very difficult to see birds in Fiji; numbers could be heard all round, but until one is very close it is impossible to get a sight of them. Therefore I found that a very small collecting-gun was the most useful for obtaining birds. Birds as well as insects are far more abundant in the Fijis than in any other of the South Sea Islands we visited; in fact, in the islands nearer to South America birds and insects were scarce. In several islands—Pitcairn, Easter Island, &c.—there is but one species of land-bird, while the further west one gets the more abundant land-birds become. The reason for this is doubtless that the avifauna of the South Pacific Islands is more nearly allied to Australian forms, and the Fijis, being nearest to Australia, have therefore a greater abundance of species. A species of butterfly (*Danais*), however, which I took in Fiji, appears to be nearest to *D. archippus** of North and South America, and may have extended its range across Pacifica.

Before finishing my short account of the South Sea Islands,

* This butterfly is found in the South Sea Islands (cf. "Geograph. Distr. of *Danais archippus*," Trans. Ent. Soc. 1877, p. 98.—Ed.

I might mention that there are practically no mammals in any of these islands, Bats excepted. There are of course Rats, but these are all imported, and belong to the well-known species, *Mus rattus*.

On May 6th we sailed from Suva for Thursday Island, Torres Straits. On May 16th several moths appeared on board; these must have come many miles by sea, the nearest land being New Guinea, sixty miles distant.

During our passage to Torres Straits several Gannets (*Sula leucogastra*) came on board, and I was surprised to see with what ease they managed to sit on the rigging. I should not have believed that a clumsy web-footed bird like a Gannet could perch on a rope as well as they did. I noticed during our passage through Torres Straits that the islands towards the Pacific end are of coral formation, while those to the westward appear to be volcanic. Several of the Torres Straits Islands seem to be the stopping-places of many birds migrating from New Guinea to Australia, and *vice versa*. As an instance, I might state that on Thursday Island I put up a pair of Bustards (*Otis australis*?) close to the town, a most unlikely place for these birds. We spent several days at Thursday Island, and whilst there I made several collecting trips in this island and the neighbouring Prince of Wales Island. An interesting sight on these islands was the enormous nests of the White Termite, several of these nests being fully eight feet in height.

On both these islands I found a species of Slowworm (*Lialis burtoni*) abundant. This species has a longer and more sharply pointed head than our Common Slowworm.

On May 23rd we left Thursday Island for Singapore. All the day we were passing numbers of Sea-Snakes, which were lying motionless on the top of the water. One of these Snakes was foul-hooked on a line which we were trailing astern; it proved to be *Acalyptophis peronii*.

The remainder of our voyage was by a route too well known to need much description. Touching at Singapore, I made a day's excursion inland, collecting insects. Here I noticed that the Sparrows in the streets were all Tree-Sparrows (*Passer montanus*).

From Singapore we steamed to Colombo, from thence to

Aden, on through the Red Sea to Suez, and through the canal to Port Said. At the latter port I took train to Kantara, which lies between the Suez Canal and Lake Menzala, where I met with Rufous Warblers and Crested Larks, both common birds, but interesting to me, as both have occurred in England. From Port Said we steamed to Gibraltar, and finally dropped anchor at Cowes on Aug. 1st, 1903, after an absence of nine months on the most delightful and interesting voyage which it is possible to make.

My very best thanks are due to the Earl of Crawford for his great kindness in taking me with him as naturalist on this most pleasant of voyages, and I trust that this account of my experience may be of interest to my readers. It must be remembered, however, that it is by no means easy to describe the various islands and places, but that they must be seen to be appreciated.

ON THE BREEDING OF THE BLACK-NECKED GREBE (*PODICIPES NIGRICOLLIS*) IN THE BRITISH ISLANDS.

By O. V. APLIN, F.L.S.

SOME years ago, while writing the articles on Grebes in the work called 'British Birds, their Nests and Eggs,' I took considerable trouble to investigate the distribution of these birds in our islands, and the various reports of the breeding of the rarer species in Great Britain. It therefore gives me especial pleasure to be able to announce that I have recently received satisfactory evidence that several pairs of the Black-necked, or, to give it its more time-honoured name, the Eared Grebe (*Podiceps nigricollis*), reared their young in Britain during the summer of 1904.

The discoverers of this most important and interesting fact prefer to remain entirely anonymous, in order that they may guard more effectually against the locality in which this little colony of Grebes has established itself becoming generally known. It is unfortunate that such a precaution should be necessary, but the reason for taking it need hardly be indicated.

The news that the birds were breeding was communicated to me at once, and, after considerable deliberation, it was decided that the fact of another species being added to the list of birds breeding in these islands ought not to be kept a secret; and that I, an outsider (for I was prevented from taking advantage of a kind offer to show me the birds), should be entrusted with the pleasing duty of making known this important discovery.

It must suffice for me to say that the names of those who had the good fortune to find these beautiful Grebes breeding with us are well known to ornithologists, and, with regard to the identification of the birds in question, would carry complete conviction to the mind of anyone; moreover, I may add that three other ornithologists have had the privilege of seeing the birds.

A transcript from the note-book of one of the discoverers has been entrusted to me, and I feel that I cannot do better than

reproduce it here almost word for word, omitting anything that by any possibility might tend to divulge the situation of the colony. He writes as follows :—

On the 3rd June, 1904, we visited a shallow lake about three-quarters of a mile in length. The surrounding ground is very marshy, and perhaps half the area of the lake itself is covered by beds of club-rush, bogbean, pondweed, and persicaria. When we were walking round the lake we caught sight of a Black-necked Grebe in full summer dress in a bed of pondweed at the edge of one of the big patches of club-rush. This bird, which we watched for an hour or so, did not feed in the open water, but passed from one bed of pondweed to another, frequently diving for short periods in a limited area. When we got round to the other side of the lake we saw another, or possibly the same, bird, diving in open water near one of the beds of club-rush; and we also watched, at a distance of fifty or sixty yards, two pairs of birds, each with two downy young. A few days later we went to the place again. At the spot where we had seen the two pairs with their young on the 3rd there were then four pairs, with one, two, two, and three young ones respectively. Sometimes one and sometimes another of these birds would be hidden in the beds of rushes or bogbean, but at times all four pairs were to be seen feeding within a limited area in the shallow water. In another part of the lake we saw a fifth pair with rather larger young, and two unattached adults. As the birds were sometimes only a few yards from us, we had an excellent opportunity of seeing the details of their plumage. When both birds of a pair were side by side, the larger size of the male was quite apparent, but little or no difference was to be seen in the plumage of the sexes. The neck, black before and behind, was clearly divided from the dull white of the breast and belly (the colour of the under parts was only seen when the birds raised themselves in the water and flapped their wings, or rolled on one side to preen themselves); when they flapped their wings the white on the primaries and secondaries showed clearly. A black frontal crest stood up, showing off the silky ear-coverts which shone like golden oat-straw; eyes a bright clear ruby, something like a ripe red-currant with the light shining through it; bill black. The rufous feathers of the flanks, which covered

much of the wings when the birds were swimming in a normal position, shone in the sun with a bronze lustre. The black neck and wings also showed metallic-green reflections. When the wings were raised to form a cradle for the young, the tips of the white feathers showed clearly. The upcurved lower mandible was clearly visible. The young were clothed in ashy-grey down, striped on the head and neck; under parts white; bill lead-coloured. The adults, when seen from behind, looked very broad in the stern, as Dabchicks do. The bill looked very short and sharp, an effect produced by its recurved shape and the abrupt rise of the frontal crest.

The birds never travelled far under water, but dived in a limited area, as Dabchicks do. The consecutive dives of one bird, which we timed, were 25, 10, 25, 24, 9, 14, 12, 25, 9, and 23 seconds respectively. Generally one of the parents attended the young, either carrying them on its back, or swimming near them, whilst the other dived for food; but sometimes both parents were under water together, a lack of caution which I have never known in the Great Crested Grebe. Both sexes carried the young on their backs. We never saw a bird dive with its young on its back as Dabchicks are said to do. The old bird, when about to rise, rose in the water, flapped its wings, and shook off the young ones.

This seems to be the invariable habit of *Podiceps cristatus* under similar circumstances. Once the brood of three young were all on the back of one parent at the same time. The little creatures clambered up over the bird's tail as the young of *P. cristatus* do. Small fish were sometimes brought up by the old birds, but the food generally captured was something else—we could not make out what. The young were fed sometimes when on the back of the other parent, sometimes when in the water. They dived for a few seconds now and then. Once when a bird passed overhead the three young in one brood went under simultaneously. On one occasion two adults faced one another with necks erect and bodies raised vertically, as Great Crested Grebes do when courting, but we could not make out whether the yellow ear-coverts were then expanded laterally.

Here these valuable field-notes come to an end.

Of the three rarer Grebes which visit this country, the present species has always been regarded as the most likely to remain to breed with us, and I may mention that in a letter addressed to the Editors of the 'Ibis' (1902, p. 165), when recording a pair of Eared Grebes killed in Oxfordshire on Sept. 19th, 1899 (which I regarded as adult birds that had passed the summer, and had bred, or tried to breed, in this country), I pointed out that parts of the British Islands lie within the geographical breeding range of this species, which is recorded to have been found in summer as far north as Jutland, and to breed commonly in Southern Spain, while to the east as well as to the south of us it is common.

There is a considerable amount of circumstantial evidence that the Eared Grebe has bred in these islands in former years, most of which I have detailed in 'British Birds, their Nests and Eggs' (vol. vi. p. 197, *et seq.*), although more has become available since that work was published. But the direct evidence that we have upon this point is scanty. Pennant ('British Zoology') says positively that these birds bred in the fens near Spalding, and he described the nest and eggs. But the only other definite evidence that I have been able to find is that of the late E. T. Booth, who stated ('Rough Notes') that a full-plumaged adult and a couple of downy mites were brought to him by a marshall. The reason why these specimens were not preserved was, no doubt, that Booth included in his collection only those birds which he had actually obtained himself. I have recently had occasion to point out (*ante*, p. 266) that the birds which bred on Chelsea Common in 1805 (figured by Sowerby in the 'British Miscellany'), which have been sometimes mentioned as belonging to the species now under consideration, were merely Little Grebes in the, at that date, little-known breeding plumage.

ON THE NESTING HABITS OF THE PIED WAGTAIL (*MOTACILLA LUGUBRIS*, TEMM.).

BY THE REV. F. C. R. JOURDAIN, M.A., M.B.O.U.

NONE of our standard works on British ornithology appear to mention the fact that this bird not infrequently adapts the nest of some other species to its own needs. I am inclined to think that the habit is more common than is generally supposed to be the case, and that many Wagtails' nests, on examination, will prove to be merely relined old nests of some other species. Since my attention was first drawn to this, I have noted down a few recorded instances of a similar kind. Thus Mr. H. Blake-Knox (Zool. 1862, p. 7997) says that a pair of these birds "took possession of a deserted nest of the Robin in an ivied wall; the young were reared." In the same volume (p. 8099), Mr. H. Reaks states that in the spring of 1861 a Robin built its nest under the thatched eaves of a garden summer-house: "this year [1862] a Pied Wagtail repaired the nest, and deposited five eggs therein." An even more remarkable instance is related by Mr. J. Ranson in 'The Zoologist' for 1863 (p. 8844): "For some years past a pair of Chimney-Swallows have built their nest and reared their young in one of our chimneys, but this spring a pair of Wagtails took possession of the old nest, and have reared one brood, and the hen, on the 29th of June, was sitting on her second laying. The Swallows made two or three ineffectual attempts to build in the same chimney, but were compelled to take to another."

Mr. J. J. B. Young has recorded in the 'Field' an instance of a Wagtail breeding in an old Thrush's nest at Stonyhurst, Lancashire; and in the same paper a correspondent from Cringleford describes how a pair of Wagtails took possession of a deserted Thrush's nest with four eggs, and built upon the top of it ('Field,' June 1st, 1895). My friend Mr. E. W. H. Blagg found a Pied Wagtail's nest with five eggs in an old Blackbird's nest in a rhododendron-bush in a shrubbery at Cheadle, Staffordshire, and in 1902 Mr. R. H. Read found a nest of the Pied Wagtail built in a nest of the Song-Thrush, from which the

young Thrushes had lately flown. This nest was exhibited at a meeting of the B.O.C. on Feb. 18th, 1908.

We generally have a pair of Pied Wagtails nesting within a hundred yards of Clifton Vicarage, and in 1902 I noticed that they were obviously breeding somewhere in the vicinity of a road with hedgerows on each side, but did not think of examining the old nests at the time. However, next year they were again haunting the same spot, and on June 14th (*ante*, p. 106) I found the hen sitting on five eggs in a big, substantial nest in the hedgerow, which I have now little doubt was an old Thrush's nest adapted for nesting purposes by the addition of a new lining. This year they took possession of an old Blackbird's nest, from which young had been hatched in 1908; a new lining was added to it, and on May 4th it contained six eggs.

Of course this list of instances where another bird's nest has been utilized by the Pied Wagtail is not intended to be exhaustive, and probably further research would bring many similar instances to light; but it is sufficient to show that this bird not infrequently adapts the nests of other birds (especially that of the Song-Thrush) for breeding purposes.

Another curious habit, of which I have not seen any previous notice, is the way in which Wagtails frequently resort to their breeding places in September, if the weather is fine. The cock takes his station on some commanding point not far off, and utters his monotonous "chizz-it" exactly as in the spring; while the hen visits the nest, picks up and plays with lining material, and behaves exactly like a nesting bird, as long as the weather remains favourable. The habit is evidently due to a slight recrudescence of the breeding impulse after the moult, which shows itself in the autumn songs with which we are familiar in the case of the Chiffchaff, Willow-Wren, and other birds, and sometimes leads to attempts to rear an autumn brood.

In the case of the Rook this appears to take place more frequently than any other bird, and I have notes of eggs or young birds in 1844 (Oxon), 1863 (Sussex and Hants), 1870 (Warwick and Suffolk), 1872 (Northants), 1891 (Suffolk), 1893 (N. Devon), 1894 (Oxon), and 1900 (Northants),* and have little doubt that this list might easily be doubled or trebled by a search through the back numbers of the 'Field,' 'Magazine of Natural History,' &c.

* Cf. *ante*, p. 870. Digitized by Google

SOME NOTES ON SWISS BIRDS OBSERVED IN JUNE, 1904.

BY THE REV. CHARLES W. BENSON, LL.D., Rector of
Balbriggan, Co. Dublin.

I STAYED at Chexbres sur Vevey this summer, as chaplain for June, for the Colonial and Continental Society, and I found it to be one of the most charming places I have ever visited in Switzerland. It is situated at a height of about 700 ft. above the Lake of Geneva, of which it commands a most delightful view, and is three miles from Vevey, and about seven from Lausanne. Two railways pass close to the village.

The Hôtel Victoria, where I sojourned, has very pretty well-shaded grounds around it, and I found that nearly every bird to be observed in the surrounding country could be observed there.

I did not on this occasion meet with any birds which were new to me, but I was enabled to study some more closely than I had done before.

The Warblers I noted were—Nightingale (one only), Wood, Blackcap, Garden, Marsh, Sedge, Reed, Chiffchaff, Whitethroat, Bonelli's, and the Willow-Warbler, the last named very rare. For the first time in my experience in Switzerland, I heard the Wryneck every day, whilst the Black Redstart, the Siskin, and the Cirl-Bunting were always to be found near the hotel; the monotonous song of the latter was unceasing. I observed no Corn-Crakes, but the pleasing "wet my foot," as we call it in Ireland, of the Quail was a daily experience. Bonelli's Warbler was plentiful in the woods, but nowhere did I hear or see a Song-Thrush; on the other hand, Blackbirds were extraordinarily numerous, and never have I heard their song to such advantage, the "serene happiness" of which Mr. Hudson speaks, as such an eminent characteristic of this lovely song, was greatly appreciated by all the sojourners in the Hôtel Victoria. The Serin-Finch only once visited our grounds, but I heard it on other occasions in the gardens at Vevey. The Great Grey Shrike

once looked down upon me from an unusually high electric pole in the neighbourhood. My last experience of this bird was at the ruins of Trimbург, near Kissingen.

The only notable bird we saw on the Rochers de Naye, 6700 ft., on June 7th, was the Alpine Chough; but there was such a vigorous snowballing going on by students from various colleges, that probably other birds deemed it well to keep at a safe distance. On the Salève, 4800 ft. above Geneva, we made but one addition to our list on June 21st—the Tree-Pipit, which we failed to notice elsewhere.

The Lake of Geneva was, as usual, patronized by the Black Kite, and also by flocks of Black-headed Gulls, the shape of whose heads seemed to me to differ a good deal from those of our birds at home; we only saw them on the rocks near Lutry. At Thonon a Common Tern appeared, but otherwise Lake Lemman seemed sadly birdless.

On the whole, I observed only fifty-eight different species in Switzerland this year, and again failed to find the Alpine Accentor. The visitors in the hotel took a lively interest in the birds around us, and a lecture on the subject which I delivered was attended by all the English in the neighbourhood.

What a pity that no cheap guide to Swiss birds can be put into the hands of the crowds of visitors to "the playground of Europe" every year. It would find many interested readers and observers.

NOTES AND QUERIES.

MAMMALIA.

On the First Occurrence of the Noctule in Scotland.—So far the Noctule is not known to have occurred in Scotland. The late Mr. E. A. Alston ('Fauna of Scotland,' 1880, p. 7) did not credit Sir William Jardine's statement in the 'New Stat. Acc. Dumf.' (p. 175) that it had been seen on the Annan in Dumfriesshire, and no more northern limit of the species than the Solway is accepted by British writers. After many years spent in working at our northern fauna, I have never heard of a single instance of the existence of any large species of Bat until Oct. 15th of this year, when Mr. Charles Eversfield, of Deune, whose father had rented the Dalguise shootings and fishings on the Tay in Perthshire, sent me in the flesh a large female Noctule (14½ in. across the extended wings), which he had killed two days previously at that place. Mr. Eversfield has a fair knowledge of our Bats, having assisted me to procure specimens on several occasions, and the unusual size of the present example attracted his notice whilst Salmon-fishing; so he procured his gun and shot it as it hawked up and down the river. Unfortunately the specimen was somewhat decomposed by the time it reached me, but I am preserving the skeleton for the Perth Museum.—J. G. MILLAIS (Horsham).

The Yellow-necked Mouse (*Mus s. flavicollis*) in Richmond, Surrey. I wish to record the above subspecies of *Mus sylvaticus*, which I took in a wood at the back of Richmond Hill on Oct. 15th last. I have often taken the typical form there, which of course is common, but this is the first time I have trapped *flavicollis*. The specimen (a fine female) gave the following measurements in millimetres:—Head and body, 98; tail, 102; hind foot, 28·5; ear, 17·5.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

Notes on the Common Shrew (*Sorex araneus*).—I have lately been going through the collection of Common Shrews in the British Museum. The Museum possesses a fine series of these, thanks to the zeal of numerous collectors throughout the British Isles. There are specimens collected in every month of the year, and this has enabled me to

determine one or two interesting points. Shrews moult twice in the year—spring and autumn—though the former moult is not complete, and consists of shedding only some of the fur. The first moult takes place in April, and by June they have put on their summer coat. The second moult takes place in September, and by November they are in full winter coat. In colour Shrews vary exceedingly, and the British Museum possesses specimens from white to nearly black. White patches on the brown fur are not uncommon, and I have seen some with the tip of the tail white. The winter coat is much darker than the summer one, and this I put down to the sun, not being strong at that time of year, and not bleaching them. This year (1904), whilst trapping Field-Mice, Voles, and small mammals generally for my collection, I was often surprised to find a Mouse in the trap which had been half-devoured by some other animal. This puzzled me for some time as to what did the mischief, until I found it out to be the work of a Shrew. That these little animals are carnivorous in their tastes is, I believe, well known, and the late Frank Buckland tells of one, in his book, 'Curiosities of Natural History,' which was found in the act of capturing a Frog. They are very sensitive, and easily killed from shock, as I can vouch. Wishing one year to procure living specimens, I set the old-fashioned wooden Mouse-trap, but always found the Shrews dead in them, and suppose they died from pure fright.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

Notes on Albinism and Melanism in Mammalia. — Why is it animals "off colour," so to speak, are nearly always smaller than those of the normal colour? For instance, the black variety of the Water-Vole (*Microtus amphibius*) is, I have always found, much smaller than the ordinary form, though I know this species varies considerably in size; nevertheless, the black form is nearly always small. I have a specimen of this, and, though fully adult, it only measures, head and body, 152 mm., and the ordinary form ranges from 185 to 214 mm. Again, albinos—or, to be more correct, white specimens—are almost invariably females, and very much smaller than ordinary coloured specimens. I drew the attention of readers of 'The Zoologist' to this in a former note with regard to the Stoat and Weasel. Albinism is not uncommon in the Hedgehog (*Erinaceus europæus*), Shrew (*Sorex araneus*), and Mole (*Talpa europæa*), and these, as a rule, are below the average size. Perhaps the reason of this is weakness or disease, but this wants investigating, and I shall be glad if any naturalist can throw any light on the matter.—GORDON DALGLIESH (29, Larkfield Road, Richmond, Surrey).

AVES.

Increase of Goldfinches in Kent.—I have noticed with great pleasure the marked increase of Goldfinches (*Carduelis elegans*) this autumn, and at the present time* in this neighbourhood quite large flocks of from twenty birds or more may be seen mingling with the countless numbers of brown Linnets, Chaffinches, and Greenfinches, which fly in clouds from the hedgerows and stubble as one passes. This increase is, I conclude, due to the "Wild Birds Protection Acts," which, I believe, prohibit the killing or taking of the Goldfinch throughout the year. — D. A. BANNERMAN (High Croft, Westerham, Kent).

Crossbills as Cage-birds.—In July last several Crossbills were consigned to a bird-dealer at Bury St. Edmunds, and we obtained a red male from him, which died in a few days, partly, I think, from the intense heat. His cage was hung out in the open air in the coolest part of the premises, and I found him dead one sultry afternoon, with his tail, or what was left of it, pointing upwards, as if he had simply fallen over from his perch. He was very tame, and fed well to the last; in fact, he had food in his beak when he died. Soon afterwards I obtained two more (a cock and hen), both showing the remains of the streaked plumage of the nestling, which were placed in the same cage, and soon became very friendly towards each other. They would eat almost anything—ears of wheat or oats, the cones of the larch or Scotch-fir, beech-mast, or ordinary seed; also the buds of the Scotch-fir and the tips of the leaves. Larch-cones seemed to be preferred to all other food, and these they would hold firmly to the perch with one or both feet, wrenching open the scales, and extracting the seeds one by one. In this way they amused themselves for hours, and would allow the closest inspection. Sometimes both took a fancy to the same cone, and a tug-of-war followed, in which the hen was usually victorious. I took them away with me on a short seaside holiday, and they caused much interest, one lady who saw them in a waiting-room inquiring if they were young Parrots. Unfortunately I lost them both on Oct. 2nd through my own carelessness, having hung them out on the front of the house without making the door of their cage secure. We searched all the conifers near the house with binoculars, but could not see or hear anything of them; so doubtless, as soon as they gained their liberty, the irresistible "Call of the Wild" made itself heard, and they moved on towards the south. I much regretted their loss, as the cock-bird especially was a most delightful and intelligent pet, and I was not without hope that with plenty of fresh air and a liberal supply

* October 15th.

of natural food, which there is no difficulty in obtaining here, he might moult into red plumage, which he already showed signs of doing.—**JULIAN G. TUOK** (Tostock Rectory, Bury St. Edmunds, Suffolk).

[A full account of Crossbills in captivity was also given by a Suffolk correspondent, J. D. Hoy, in 1884, to 'Loudon's Mag. Nat. Hist.' vol. vii. pp. 54-5. According to Bechstein, great numbers were bred in aviaries in Thuringia.—Ed.]

Lapland Bunting at Warwick.—On the 21st ult. a birdcatcher brought me alive an example of the Lapland Bunting (*Calcarius lapponicus*), which he had taken in a clap-net a few hours previously near Acocks Green, in the county of Warwick, about four miles from the city of Birmingham. It is a male, the russet collar showing fairly distinctly, and the whole plumage and claws bright and clean. The man stated that before taking this two birds had dropped in the net, but, thinking they were "Titlarks," he had let them go, but shortly afterwards two Chaffinches and another alighted, and he pulled. I have four specimens of this bird in my collection, three of them taken at Yarmouth, and one in Sussex, in the winters of 1892-93, and I have carefully compared the Warwickshire bird with them. In doing so I noticed a considerable variation in the amount of white in the second outer tail-feathers, and, roughly measuring this in each specimen, I found as follows:—

Yarmouth Birds.—No. 1. Width at tip of feather, $\frac{1}{2}$ in.; length, $\frac{1}{4}$ in. No. 2. Width at tip of feather, $\frac{1}{2}$ in.; length, $\frac{1}{2}$ in. No. 3. Width at tip of feather, $\frac{1}{4}$ in.; length, $\frac{1}{2}$ in.

In the Sussex and the Warwickshire birds this feather was entirely black, though in the former I am not sure that there is the full complement of feathers, there being only ten, while all the others have twelve. In the Yarmouth bird, No. 3, the white is a mere streak, and is slightly obscured with black for about a quarter of an inch towards the tip, and the white is hardly white but rather buff, something like the edges of the dorsal feathers, but of a lighter shade. In no case is the white patch nearly so large as that in the corresponding feather of the Reed-Buntings I have. The length of the hind claw seems also subject to variation; in one of the Yarmouth birds it is fully $\frac{1}{2}$ in. long, in all the others about $\frac{1}{4}$ in.—**THOMAS GROUND** (School Lane, Moseley, Birmingham).

Lapland Buntings in Norfolk.—Mr. Clement T. Carroll writes me word that he has received two living Lapland Buntings, captured on the denes at Great Yarmouth in September. The first, a female, was taken on the 18th, and the other, a young male, on the 24th. Snow-

Buntings were reported as arriving at Yarmouth this autumn much earlier than usual.—O. V. APLIN (Bloxham, Oxon).

Curious Habit of Starlings.—I should like to draw your readers' attention to a curious habit I noted this year, for the first time, amongst the Starlings (*Sturnus vulgaris*); I refer to their mode of hawking after flies in the same manner as Swifts and Swallows. A number get together, flit their tails and wings, spreading them out, now drawing them in, and tumbling about in the air as the above-mentioned species often do. The Starlings have increased enormously with us of late, and have taken to building in the ivy, as the holes and spouts are full up with nests.—W. H. WORKMAN (Lismore, Windsor, Belfast).

Hooded Crow (*Corvus cornix*).—A specimen of this rare visitor to Cheshire has been shot at Hollington, near Chester, on Oct. 18th, 1904. A. NEWSTEAD (Chester).

Hoopoe (*Upupa epops*) in Cheshire.—A Hoopoe was shot in a potato-field on the outskirts of Sale on Sept. 21st. It had been seen in this and the adjoining fields since the 17th, and with characteristic tameness had allowed those interested in its appearance to approach within ten yards of it again and again as it fed. The bird is immature, the plumage of the throat and breast being pale, and the beak measuring, in a straight line from the gape to the tip of the upper mandible, 2·1 in., the culmen 1·75 in.—CHAS. OLDHAM (Knutsford).

Boldness of the Buzzard.—I was greatly interested in Mr. Salter's account of the unusual boldness of this generally shy bird. Though, in my experience, I have found the Buzzard nearly as shy and timid as the Golden Eagle at its nesting haunts, a friend of mine had once a very different experience. While ascending a rocky mountain in the "Clyde" area, where perhaps the Buzzard is more justly entitled to be termed "Common" than in most parts of Scotland, he was startled by the behaviour of a large bird. From his description this was evidently a Buzzard. He was, along with his son, climbing up a narrow ridge of rock leading to the summit, when suddenly the Buzzard appeared, and, in his own words, "after circling two or three times about me, struck the rock more than once with its wings within a yard of my head, at the same time uttering sounds of rage. It next flew to my son, striking the rock as before, and after that repeated the attack on each of us. Finally, with larger sweeps, it disappeared, and left us to pursue our way in peace." This was on "Queen's Birthday, 1900," probably May 21st; a period when the Buzzard should be hatching. I was greatly interested in my friend's

account, and on visiting the neighbourhood the following autumn took the occasion to search the spot, to see if it was possible the bird had been defending a nest. This appeared very unlikely, as the attack took place practically at the summit of a mountain nearly 8000 ft. high. No trace of a nesting-place could be seen. I know of at least three occupied eyries within two miles of the spot, but all are between 1000 and 2000 ft.; none near summits. The nearest is well over a mile distant. In the spring of 1902 I found and examined a nest containing three eggs in the neighbourhood (April 20th), but in this case the birds behaved in their usual manner, sailing round with their wailing cry, and gradually disappearing. I may say that the eggs were not disturbed by me, and were probably hatched, as the buttress on which they were placed was decidedly difficult of access. The nest was not remarkable except for its small size—merely a lined hollow in the turf—and for its containing a large quantity of thick string. My only theory to account for the attack is that the bird which made it belonged to the eyrie about a mile away, and had been recently robbed when almost hatching. I am glad to say that the Buzzard in this district seems little persecuted, and that diabolical atrocity, the pole-or stamp-trap, appears to be little, if at all, used. Though I have never seen the Buzzard behave in the manner described by Mr. Salter, yet I have known two other species of birds of prey—the Merlin and the White-tailed Eagle—to exhibit great boldness in defence of their nests, and have been told an apparently authentic story of the killing of a would-be robber by a pair of the latter birds. Possibly the incident in the Frithjof Saga is close to actual fact. The gun is no doubt the secret of the modern timidity of naturally fierce and bold wild mammals and birds.—H. RÆBURN (Craigmillar, Edinburgh).

Habits of Willow-Grouse: a Reply.—In 'The Zoologist' for September (*ante*, p. 348), Mr. J. A. Harvie-Brown has made a critical remark anent a passage found in a paper written by me about some "Riporre" specimens, and published in the P. Z. S., 1904, pp. 411-15. I have related there that the young hybrids, when they got scared, "perched in trees, as the Black-game does, *unlike the Willow-Grouse*." Mr. Harvie-Brown seems to find this statement about the difference in habits of the Black-game and Willow-Grouse incorrect, and declares that he has seen "scores of Willow-Grouse perch on trees!" In the *winter*, when the snow is deep and heavy, and the Willow-Grouse cannot find its food on the ground, and therefore to a great extent must feed on the buds (especially "amenta") of birch-trees, it is a common occurrence to see such birds perching on trees. The condition

is, however, quite different when the ground is bare—not covered by snow. At that time I have never seen any Willow-Grouse perch on trees, and this is the experience of several sportsmen I have consulted on the point. I am therefore inclined to believe that during that time of the year the Willow-Grouse never perches on trees. Certainly the Willow-Grouse does not, when scared by hunting-dogs, take its refuge in trees, but, as everybody knows, this is almost the rule when young Black-game are scared similarly in a woody district. (The peasantry in Scandinavia do therefore, and especially did in former days, hunt the young Black-game in the autumn with barking Dogs.) In consequence of this I think that I was perfectly right in pointing out the contradistinction in this respect between the parental birds of the “Riporre,” and in saying that the habits of the hybrids were similar to those of the Black-game when they perched on trees. It must of course be remembered that in the paper quoted I speak about the habits of the hybrids “during the summer and autumn of 1901,” and that I state that the last of them were “shot in the month of October.” The criticism of Mr. J. A. Harvie-Brown appears accordingly to be hardly necessary.—EINAR LÖNNBERG (Stockholm).

Spotted Crake (*Porzana maruetta*) in Co. Antrim. — A Belfast gentleman, whilst Snipe-shooting at Silversprings, near Templepatrick, Co. Antrim, on October 8th last, shot one of these rare visitors along with a Common Snipe, both birds falling to the one barrel. Thinking it was a Water-Rail, the bird was thrown away, but fortunately was recovered again, and brought to Messrs. Sheals, taxidermists, Belfast, who identified it, and by whom it has been admirably set up. On dissection it proved to be a young female. Ussher and Warren, in their ‘Birds of Ireland,’ record five occasions on which this bird has been obtained in Co. Antrim; so this makes the sixth. A strange coincidence is that on the same date, viz. Oct. 8th in 1898, Messrs. Sheals had one of these birds sent to them for preservation, shot at Cullybackey, Co. Antrim.—W. C. WRIGHT (Belfast).

Swimming Powers of the Oystercatcher.—I was much struck with the swimming powers of an Oystercatcher (*Hamatopus ostralegus*) which I witnessed at the North Bull, Dublin Bay, when in company with Messrs. A. and E. Williams on Oct. 23rd last. The bird, when we first saw it, was wading along the water's edge, and, as we mounted the sand-hills and appeared in full view, it commenced to race along the beach for a short distance, and then took to the water. It was slightly wounded, and unable to fly. Swiftly and strongly it headed out to sea, retreating from us as we ran down to the water's edge to

intercept a gunner who was approaching us along the shore, and who, we were afraid, would seal the poor bird's fate before it could swim out of gunshot range. Happily, however, fully eighty yards of water were traversed ere the shooter arrived opposite it, and, by diverting his attention, we managed to get him to pass by the bird without observing it. Next we directed our gaze seawards, and descried the Oystercatcher as a small dark object bobbing up and down on the waves some two hundred yards from the shore. We expected it would reach a sand-bank about to be laid bare by the ebbing tide; instead of this, however, it retraced its course, and headed for the beach, swimming strongly against the tide. Seeking ambush amid the rushes of the sand-dunes, we watched the bird swim in. Directly it landed I rushed after it barefooted (lest the bird might take to the water a second time), and, after an exciting chase along the shore, succeeded in capturing it. On examination the bird proved to be a beautiful adult in fine plumage, and only slightly injured in the right wing. Curiously enough, the rich crimson pigment was absent over a small area of the iris, giving to the pupil an irregular and rather jagged outline. This condition was symmetrical in both eyes. In the afternoon I took the bird to the Dublin Zoological Gardens, where, it is to be hoped, it will have a happy time, and end its days in peace. I noticed that the wing had healed considerably, so that the bird had probably been living a week or more in a disabled condition on the beach before I captured it. The wonder is how it escaped, as wounded birds have to run the gauntlet of being attacked by many enemies—Man, Dogs, Hawks, Skuas, and the larger Sea-Gulls. For instance, during the short time that we saw it on the water a flock of screaming Herring-Gulls passed over it; their cries attracted a Great Black-backed Gull, which made a few nasty swoops at the poor Oystercatcher. Indeed, I doubt if the latter would have reached the shore alive had not a few Herring-Gulls mobbed the assailant, driving him off with angry threats. It is interesting to note that it was directly after the Gulls cleared away the Oystercatcher began to swim for the shore. Question: Could the bird have apprehended further danger on the water, or was it simply exhaustion that drove it ashore, or both? I may add that I have repeatedly seen several species of Limicoline birds swim, generally, but not always, to escape danger, and usually for shorter distances than the above instance which I have recorded.—C. J. PATTEN (University College, Sheffield).

The Red-throated Diver (*Colymbus septentrionalis*).—All Irish ornithologists, and especially those who take an interest in our rare

breeding species, deplore the wanton cruelty and persecution that is meted out every season to these fine birds, and possibly the only pair at present known to breed in Ireland. This year the first clutch of eggs were taken by a native—who was doubtless well rewarded—and sent to Dublin; the exact address can, if necessary, be disclosed later. The birds, thus frustrated in their first attempt, changed the nesting-site, and, although the whole country-side was searched, the second nest, I am glad to say, was never discovered. The parent birds were seen during the month of August flying backwards and forwards from the sea, generally with fish, and by the middle of September they had disappeared from the district.—W. C. WRIGHT (Belfast).

Modern Egg-collecting.—The Rev. J. G. Tuck, in his interesting note (*ante*, p. 351), has voiced a suspicion which must have occurred to many. While the numbers of several of our rarer birds rapidly approach vanishing point, the dealers continue to offer in undiminished numbers recently-taken clutches of their eggs, "with full details." Every right-thinking naturalist must rejoice when the wealthy collector who has been so foolish as to give £15 for his set of Welsh Kites' eggs is imposed upon by the substitution of a foreign clutch. I say this advisedly, knowing something of the ruin which the modern system of egg-collecting is bringing to our rarer native species, such as the Raven, Buzzard, and Kite. Posterity will probably condemn altogether the practice of making private collections of eggs, especially those in which it is sought to illustrate every possible variety of colouration by means of a large series of clutches of the eggs of each species, however rare it may be. Many are induced to collect eggs by the same impulse which prompts others to amass old china or bric-a-brac, but with the difference that the harm which they do is irreparable. Their selfish greed and love of acquisition are seriously impoverishing the British fauna. Unfortunately the high prices obtained for "well-authenticated clutches" at recent sales, encourage the unscrupulous collector to pay a high figure in the belief that the value of his eggs will increase with the growing scarcity of the bird which laid them, and that consequently his collection can at any time be disposed of at a profit if brought under the hammer. As illustrating the persecution to which our rarer birds are exposed, it may be mentioned that in a certain district in mid-Wales there are seven pairs of Ravens. They have not been allowed this year to bring off a single young bird. The Buzzards have fared very little better, while, needless to say, the Kites, now reduced to a miserable remnant of three or

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four pairs, have once more been plundered. The writer would ask others to join him in strongly appealing to all true naturalists to refrain from acquiring British-taken eggs of any species which is within measurable distance of extinction in these islands.—J. H. SALTER (University College, Aberystwyth).

Shore-Birds at Burnham, Somerset.—While spending a few days at Burnham, at the end of last September, I usually took a stroll on the sands before breakfast, in order to watch the wading birds which frequent the large mud-flats at the estuaries of the Rivers Brue and Parrett. A little to the north of Burnham, and nearly three miles from the sand-hills, lies an extensive bank called the Gore Sand, which is only covered by the highest tides. At high water this bank is an island, and affords a safe resting-place for thousands of birds while their feeding-grounds on the mud-flats are covered by the tide. Soon after 7 a.m., on Sept. 24th, when the water had just begun to ebb, I stationed myself on a high sand-hill, armed with prism binoculars of twelve diameters magnifying power. The rising sun at my back was shining directly over the fast-appearing mud-flats, and lit up brilliantly the ridge of the Gore Sand. Even at that long range my powerful glasses enabled me in the bright light to identify many of the sea-fowl which were crowded together on the bank. A dazzling white line of many thousands of Gulls stretched across the ridge, and by the well-known cries which came to me over the water, I should say that the majority belonged to the black-headed species. Here and there a very large Gull with deep black back, probably *Larus marinus*, would show up conspicuously among the smaller species. A crowded group of many hundreds of Curlews were huddled together near the Gulls, and their shrill wailing cries were constantly to be heard. About one hundred Sheld-Ducks were also resting on the ridge, and these seemed to be anxious to commence feeding, as many were continually rising and flying round with that buoyant flight of theirs, less laboured than that of most of the Duck species. A bunch of smaller black and white birds were probably Oystercatchers, but the range was too far for my glass; there could be no mistake, however, in identifying those nine tall grey statues as watchful Herons. Ever and anon flocks of little Waders would dash past the resting birds, and suddenly, as all turned together, their under parts would flash white in the sunlight, giving the appearance of a drifting storm of snowflakes.

While I am watching this interesting assemblage on the sand-bank, the ebbing tide is fast laying bare the mud-flats close in front of my position, and birds keep arriving from all sides, and settling within

easy range of my glasses. The small Waders are mostly Dunlin and Ringed Plovers, some of the former still retaining traces of their dark breast-feathers; but among these it is easy to make out a good many Turnstones, and several times I catch their chattering cry. A Whimbrel is busy looking for a meal; in these parts a local name for this species is "Cowslip Bird," because its spring arrival coincides with the opening of that flower; but the bird before me would be a visitor on its way south from northern breeding haunts.

Presently I turn my glasses on a bird circling round with rather unsteady flight, and evidently about to alight on the mud. The tail is dark, and the upper tail-coverts conspicuously white, and as the bird pitches on the mud close to a Curlew and a small party of Grey Plovers, I get an interesting study in "bills." He is a Godwit, perhaps belonging to the rarer black-tailed species, and his slightly upturned beak contrasts with the long downward-curving bill of the Curlew and the short straight ones of the Plovers. Each no doubt is adapted for securing a particular kind of food. On the sands are parties of Pied Wagtails, and among the dunes around me are twittering flocks of Greenfinches and Linnets, busy with the seeds of various plants. The air is full of Swallows and House-Martins, mostly young birds, preparing for their southward flight. These are hawking very low, and constantly alighting on the sand. Their prey is probably a species of grey fly, which may be seen in numbers on the sandy shore.

Every minute more and more stretches of oozy mud-flats are laid bare, and hidden sand-banks begin to make their appearance above the receding tide. The crowd of birds on the Gore Sand gets more and more restless; Gulls, Curlews, Ducks, and Waders drift away in straggling parties to spread over the rich feeding-grounds, until the return of the tide shall impel them once more to assemble on the sand-bank, which is for them a safe haven of refuge.—F. L. BLATHWAYT (Lincoln).

AMPHIBIA.

Newts in North Wales.—In reply to Mr. Forrest's question (*ante*, p. 891), I may say that the Common Newt (*Molge vulgaris*) occurs in Denbighshire, where I have found it near Trefnant, associated with *M. cristata*; but, although I have sought for it in many places, I have never found it in Carnarvon or Anglesea. In these counties *M. palmata* is the dominant species. In Carnarvon I have taken it near Abersoch (Zool. 1888, p. 894), and, associated with *M. cristata*, in a pond in a limestone quarry on the Little Orme. In Anglesea it occurs near

Ty-croes and Valley (Zool. 1892, p. 272), at Llangoed, Aberffraw, Bodorgan, Cemmaes, on the cliffs near Penmon Priory, in small pools high up on Holyhead Mountain, and, associated with *M. cristata*, at Moelfre. The Palmated Newt—occasionally, at any rate—passes the winter in the larval state. On April 5th, 1896, I found undeveloped examples about 28 mm. in length near Nantglyn, Denbighshire (Zool. 1896, p. 147), and on April 7th, 1901, I took many from a pond in a quarry at Shebbear, North Devon, which measured 24–29 mm. In Anglesea, in 1902, I found larval Newts of this species with the branchiæ still persisting so late as the first week in June.—CHARLES OLDHAM (Knutsford).

NOTICES OF NEW BOOKS.

The American Natural History; a Foundation of Useful Knowledge of the Higher Animals of North America. By WM. T. HORNADAY. George Newnes, Lim.

THE higher animals dealt with in this volume are Mammals, Birds, Reptiles, Amphibians, and Fishes of the Nearctic fauna. The volume contains the best illustrations we have seen for a very long time, and we are told in the preface: "Because of the limitations of the camera, several thousand dollars have been expended upon the beautiful drawings by Messrs. J. Carter Beard, Carl Rungius, Edmund J. Sawyer, and a few other artists, which adorn as well as illustrate this work." There are also a number of original photographic illustrations, and the work is commendably free from the old friends one usually finds served up in the illustrations to new books on natural history.

As regards the subject-matter, Mr. Hornaday possesses some very strong convictions. He is no admirer of our modern method of "nature studies," and we read that "the author maintains in this volume, and also out of it, that *System* is the only master-key by which the doors of Animate Nature can be unlocked"; and we are glad to learn that, through the advice of Dr. T. S. Palmer and others, "the author's old-fashioned preferences on certain points of nomenclature were abandoned, and the names of orders, families, genera, and species were brought down to date." Still, some ambiguity exists owing to a somewhat archaic terminology. Thus we read that, "except man, the mammals which live upon land are also called quadrupeds," though further on, that, "although the Bat is a true mammal, it is almost as wide a departure from the ordinary four-legged, land-going type as is a Whale or Manatee." Query: Are we to understand that a Bat is a quadruped? A further doubt crosses our mind as we examine the excellent illustration of "Skeletons of Man and Gorilla." Mr. Hornaday states that "the widest differences between Man and the Gorilla are in their skulls," and certainly

this is accentuated in the figure of the human skeleton, whose skull might reasonably be supposed to have contained the brains of a philosopher, or a "Caucasian philosopher," as our author writes in another place. This is scarcely a comparison an evolutionist would make; the skull of the Gorilla should be compared, say, with a prognathous negro skull, or, better still, a copy might have been made of the frontispiece to Huxley's 'Man's Place in Nature.' Thus "system," which the author inculcates as the "master-key," is perhaps the weakest part of this book, and the discarded "nature study" the strongest, for Mr. Hornaday has contributed a mass of bionomical information that alone would canonize his volume, and, with the beautiful illustrations, render it one that should not only be on the book-shelf, but also frequently taken down for reference.

Creatures of the Sea; being the Life Stories of some Sea Birds, Beasts, and Fishes. By FRANK T. BULLEN, F.R.G.S.
Religious Tract Society.

READERS who have in fancy sailed with Mr. Bullen in the 'Cruise of the Cachalot' will welcome another voyage with him round the world in search of the animal life best known to seamen. At one time these creatures were familiar to all who crossed the seas, to both mariner and passenger; but that was in the days of the sailing-vessel, which, to pick up the "trades," and to avoid currents, covered more ocean surface than the straight course made by the steam "liners" of to-day, which, by their regularity of route, must be creating a veritable "cinder-track" on the ocean floor. We now no longer expect to see the "Booby" perching on the yards or booms, to see the Shark and Pilot-fish cruising round the ship as it lay becalmed, or to fish for Bonito, Albacore, or the lovely *Coryphæna*; the passenger now is most interested in the "ship's run," and the prospect of an early arrival.

Mr. Bullen is at his best in recording his own observations, and quite away from the consultation of authorities; many bionomical facts at first hand are to be found, and when he indulges his fancy, as in the "Autobiography of a Sperm Whale," he treats his subject with no small amount of literary skill. He is rightly

sceptical on the subject of the so-called "Sea-Serpent," but, in proposing explanations of what may have been seen, he has not consulted Prof. Collett's memoir on '*Chlamydoselachus anguineus*.' Mr. Bullen states that the Great Albatross is never seen alive north of the Equator, and is inclined to say that the Mollymauk "is not found any further north than its great relative"; but *Diomedea melanophrys* has undoubtedly visited the Orkneys, and an exhausted individual, as recorded in these pages, was captured in Cambridgeshire in 1897. However, we do not wish to be critical on a book that absolutely reeks of the ocean, and recalls the days and sights appertaining to early passages made in sailing-vessels; the illustrations are revelations of the sea, in some of which we see the great swell, the swirl and heave, the spray, and other features, in happy contrast to the wooden waves or flat surface of glass so frequently depicted.

Mr. Bullen is a teleologist. In describing the habits of the *Mysticetus*, or Right Whale, he writes:—"The Almighty has ordained that these vast denizens of the frozen Northern Seas shall be at no pains to secure an abundant supply of food." But he almost immediately records how "the fierce *Orca gladiator*, or Killer Whale, attacks and overcomes them"; the Sword-fish (*Xiphias*) "attacks the *Mysticetus* with almost maniacal fury"; he is absolutely certain that he has seen the "Thresher" Shark (*Alopias vulpes*) "attacking the Whale at close quarters," and that this unfortunate mammal "is begirt with enemies." Is it not better to bear in mind "that the whole creation groaneth and travaileth," and there leave the matter?

This is a book to take to sea with us, to advocate for ship-libraries, and to read at home when we would wish—

"The waters with their world were all before."

EDITORIAL GLEANINGS.

WE have received from Dr. R. Gestro, of Genoa, an excellent and sympathetic biographical notice of the late Leonardo Fea, who died in April of last year. Fea was born in 1852. Originally destined for the profession "del padre," he early imbibed a love of natural history, especially entomology, and made several well-known zoological expeditions. Of these he will always be remembered by his travels in Burma. The "Viaggio di L. Fea in Birmania e regioni vicine" has now been recognized by zoologists as a classical expedition which resulted in immense contributions to our knowledge of the fauna of that region, and Dr. Gestro contributes the titles of one hundred and fifteen papers which have been published by specialists on the material then collected, which comprised examples of all the dominant orders of animal life. In the tropics he never spared himself, and we have heard from Indian residents how lightly he regarded fatigue and danger. He belongs to the roll of zoological pioneers commencing with Bates and Wallace, and at present terminating with Doherty and Fea.

FROM the Bedale country comes an interesting story of a litter of Black Foxes—a most unusual occurrence. They are upon the estate which at one time belonged to the Duke of Cleveland, a mighty hunter. This remarkable freak of nature reminds one (says the 'Daily Dispatch') of the old superstition that to run a black Fox is almost certain death to those who follow in the chase.—*Norfolk Weekly Standard*, Oct. 22nd, 1904.



CURIOUS VARIETY OF PLAICE (*Pleuronectes platessa*).

Cf. p. 448.

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SOME FISH-NOTES FROM GREAT YARMOUTH FOR 1904.

BY A. H. PATTERSON, A.M.B.A.

(PLATE V.)

THE year 1904, as far as occurrences of rare and interesting fishes are concerned, has, to me, been a most disappointing one. This is the first year for some considerable period wherein I have been unable to record at least one new species for the county of Norfolk. I have every reason to believe that my shrimper friends and others have been equally alert for strange marine products with which to delight me, but there has been a decided paucity of fishes other than those of common and everyday occurrence; and during the present Herring fishery the same conditions have obtained.

In looking through my "note-book" for the past year, I have also to regret a want of the usual interesting items referring to strange Crustaceans, and even Birds; and as for Cetaceans, my records are practically nil. The incursion of so many snorting and restless steam-luggers into the haunts of these equally queer sea-monsters would seem to have had the effect of scaring them off the fishing grounds. Only two Porpoises, to my knowledge, have so far been landed.

My first "fish-note" for the year refers to a Sole (*Solea vulgaris*), 11½ in. in length, the head of which only was of the
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normal colour, the rest of the body being perfectly white. This was on Jan. 12th.

On Feb. 29th I obtained a Plaice (*Pleuronectes platessa*), 9½ in. long, whose head, and the anterior part of the body as far as half the length of the upper pectoral fin, were of the normal colour; the remainder and the greater part of the fish was of a pure white quite to the extremity of the tail. On the "surrounding" fins were three or four small but brilliantly red spots.

On March 2nd quite an interesting menagerie characterized the fish-wharf; from the two or three odd smacks still fishing out of Yarmouth (at one time the headquarters of the trawling industry) were a number of deep-sea fishes, including a four-stone Angler-fish (*Lophius piscatorius*), a large Lumpsucker (*Cyclopterus lumpus*), a fair size "double-Turbot," both sides being coloured, and spined, alike, save on the under side of the head; this was white only. Not far away was a perfectly albino Turbot, the size of a soup-plate.

A couple of 7½ in. examples of *Sebastes norvegicus* came in on March 11th. I sent one of them to Mr. T. Southwell, calling his attention to an unusual spot upon either side of it; to which he made reply: "The spot on the gill-cover is a new feature to me."

March 8th, a 2½ in. Ballan Wrasse (*Labrus maculatus*), given to me from a shrimp-net. It was magenta in colour, with white spots on the "cheeks."

After several years' intentional looking for it, Montagu's Blenny (*Liparis montagui*) turned up on March 19th. It had been recorded for the Norfolk Estuary (the Wash), but hitherto had escaped detection. I obtained it through the good offices of a shrimper, whom I had commissioned to bring to me any "queer-coloured" *Suckers*—the name usually applied here to the Unctuous Sucker (*Liparis vulgaris*), and whose yellow carcasses, fantastically streaked with white in many patterns, are well known to them. The example was of a bright mahogany colour, and naturally caught his eye, after his instructions. It was in ova. A second, also a female, 2½ in. in length, was obtained on March 28th, and a third, also in spawn, on April 25th. I was exceedingly glad to be able to give the fish a place on my Yarmouth list.

A shrimper brought me a Rock Goby (*Gobius niger*) on April 14th; length, three inches all but one-eighth. Another on April 20th.

I obtained a 18-inch Plaice on April 25th, whose anal and dorsal fins continued around the posterior end, uniting *under* the tail, thus giving to the creature a very curious appearance, which was much heightened by a dark patch of colouration at the end of the fish, on its under side. (Cf. Plate V.).

A friendly fish-merchant, who was staying at Milford Haven, forwarded me a very nice example of the Bellows-fish (*Centriscus scolopax*), which reached me on April 28th. It measured $7\frac{1}{4}$ in. in extreme length; this may be considered a large example. It had been landed there by one of the trawlers. It is now in Yarmouth Tolhouse Museum.

On June 7th I obtained a hybrid Turbot-Brill, measuring $14\frac{1}{2}$ in. in length, and weighing 24 oz. It had the head Turbot-like; the upper surface was smooth and knobless, and in colour very like the Brill. I also met with, on the same date, a fish which evidently was a cross between a Flounder and a Plaice. It had scales like a Plaice.

An 18-inch Grey Mullet (*Mugil chelo*) took into its head to jump out of the river, on the night of Aug. 12th, into the ferry-boat that crosses the river, to the no small surprise of the man in charge.

Herring-syle was conspicuously absent in the river all July and August, a fact that appeared to me to account for the very few Terns frequenting Breydon this summer and autumn. Usually the river and Breydon are alive with them during the hot months, and the Terns are there to enjoy their society and appreciate their capers.

A Herring of mature growth was preserved for me on Nov. 17th by Inspector Wharfe at the fish-wharf; it had a large excrescence in its back, a lump equal in size to a walnut, which looked almost as if it had been a nut half-opened and fitted saddle-wise to it, just behind the head. I forwarded it to Mr. Southwell for dissection, who states that it had an encysted tumour, and that the fish, which was much attenuated, must have had a bad time. The tumour contained watery fluid.

A double-Flounder was sent me by Mr. W. Lowne, taxidermist,

early in November. It was the size of a business envelope, was coloured alike on both sides, and the "travelling-eye" had remained in a notch on the "edge" of the fish, which gave it the doubtful convenience of being able to see on either side, if swimming vertically.

On Nov. 19th a Fifteen-spined Stickleback (*Gasterosteus spinachia*) was taken in a Smelt-net up the River Bure, some five miles from the sea. It is rather unusual to meet with it here at this season of the year.

A ten-pound "Bull-dog" Codfish was shown me on Nov. 23rd. The "snout" only protruded about an inch beyond the eyes, the upper part of the head being rounded off like a massive forehead, giving the ugly creature a remarkably brainy appearance.

Other than fishes, my most interesting marine "entries" refer to the Marbled Swimming Crab (*Portunus marmoreus*), obtained on March 15th; a female Masked Crab (*Corystes cassivelaunus*), on March 17th; a Smooth Hermit Crab (*Pagurus lævis*), on March 28th, living in a *Murex erinaceus* shell; and two of the shell-less Mollusca, viz. *Scalaria communis*, on July 4th; and *Aplysia punctata*, on Oct. 11th, the latter, however, being sent me from the neighbourhood of Cromer.

THE SINGING HAUNTS AND HABITS OF SOME BRITISH BIRDS.

By W. GYNGELL.

SOME notes having recently appeared in 'The Zoologist' on the singing of birds on house-tops and at night, the following personal observations on the singing of birds may be of interest :—

Birds that sing in high trees :—Mistle-Thrush (*Turdus viscivorus*), Song-Thrush (*T. musicus*), Blackbird (*T. merula*), Redstart (*Ruticilla phœnicurus*), Robin (*Erithacus rubecula*), Blackcap (*Sylvia atricapilla*), Garden-Warbler (*S. hortensis*), Golden-crested Wren (*Regulus cristatus*), Chiffchaff (*Phylloscopus rufus*), Willow-Wren (*P. trochilus*), Wood-Wren (*P. sibilatrix*), Great Titmouse (*Parus major*), Blue Titmouse (*P. cæruleus*), Coal-Titmouse (*P. ater*), Tree-Pipit (*Anthus trivialis*), Pied Flycatcher (*Muscicapa atricapilla*), Greenfinch (*Ligurinus chloris*), Goldfinch (*Carduelis elegans*), House-Sparrow (*Passer domesticus*), Chaffinch (*Fringilla cœlebs*), Linnet (*Linota cannabina*), Corn-Bunting (*Emberiza miliaria*), Starling (*Sturnus vulgaris*), Green Woodpecker (*Gecinus viridis*), Cuckoo (*Cuculus canorus*), Stock-Dove (*Columba ænas*), Ring-Dove (*C. palumbus*), Turtle-Dove (*Turtur communis*). These all sing regularly in high trees.

The following species I have only rarely heard singing in trees :—Meadow-Pipit (*Anthus pratensis*), Swallow (*Hirundo rustica*), Martin (*Chelidon urbica*), Yellow Bunting (*Emberiza citrinella*), Crossbill (*Loxia curvirostra*), Whinchat (*Pratincola rubetra*), Whitethroat (*Sylvia cinerea*), Pied Wagtail (*Motacilla lugubris*).

Birds that sing in bushes and hedges :—Commonly, the Song-Thrush, Blackbird, Whinchat, Stonechat (*Pratincola rubicola*), Robin, Nightingale (*Daulias luscinia*), Whitethroat, Lesser Whitethroat (*Sylvia carruca*), Blackcap, Garden-Warbler, Chiffchaff, Willow-Wren, Sedge-Warbler (*Acrocephalus phragmitis*), Reed-Warbler (*A. streperus*), Grasshopper-Warbler (*Locustella*

nævia), Hedge-Sparrow (*Accentor modularis*), Blue Titmouse, Wren (*Troglodytes parvulus*), Greenfinch, House-Sparrow, Chaffinch, Linnet, Reed-Bunting (*Emberiza schæniclus*), Corn-Bunting, Yellow Bunting, Nightjar (*Caprimulgus europæus*), Turtle-Dove. Rarely, the Starling and Tree-Pipit.

I have heard the following species regularly singing on rooftops and other buildings :—The Swallow, Robin, House-Sparrow, and Starling. Occasionally the Great Titmouse, Hedge-Sparrow, and Wren. Once only the Song-Thrush.

Those heard singing on the ground include the Ring-Ouzel (*Turdus torquatus*), Dipper (*Cinclus aquaticus*), Pied Wagtail, Starling, Cuckoo, and Land-Rail (*Crex pratensis*).

Those heard singing on the wing include the Whitethroat, Dipper, Great Titmouse, Tree-Pipit, Meadow-Pipit, Swallow, Martin, Linnet, Greenfinch, Corn-Bunting, Sky-Lark (*Alauda arvensis*), Wood-Lark (*A. arborea*), Lesser Redpoll (*Linota rufescens*), and Swift (*Cypselus apus*).

Several species of birds delight to sing—scores or hundreds together—in chorus, and those I have heard include the Starling, House-Sparrow, Linnet, Swallow, Martin, and Swift.

I have heard the following birds singing whilst perched upon telegraph-wires :— The Whitethroat, Pied Wagtail, Swallow, Corn-Bunting, and Cirl-Bunting (*Emberiza cirlus*).

The Little Grebe (*Podiceps fluviatilis*) sings (?) upon the water.

Birds singing at Night.

To the list given under this heading in the August issue of 'The Zoologist' should be added the Sedge-Warbler and the Grasshopper-Warbler, which are very regular night-singers. The Nightjar, Tawny Owl (*Syrnium aluco*), and Land-Rail also are often noisy at the peaceful midnight hour.

As it has not been my good fortune to hear the *night* song of the Wood-Lark, which is unknown here, I am unable to endorse the testimony of other ornithologists who speak in its praise.

Scarborough.

NOTES ON THE INDIAN ANATIDÆ.

BY GORDON DALGLIESH.

INDIA is a country that is particularly rich in Ducks. By Ducks, I mean *true* Ducks, not including the Swans and Geese. These I shall not deal with in this paper.

Everybody ought to know a Duck when they see one, but I am sorry to say some people do not, and when I was in India I have had Moorhens and Cormorants pointed out to me as "Ducks"; and one of my friends once shot and ate one of the latter, thinking it was a Duck.

As Mr. Finn remarks in his book, 'How to know the Indian Ducks,' the last few years have been remarkable for an invasion of India by East-Asiatic waterfowl, and some species that were once considered very rare or unknown in India have been taken in some numbers. Thus we have the Green-headed Pochard (*Nyroca baeri*), which was until quite recently confounded with another species, the Common White-eyed Pochard (*N. nyroca*), which is now found to be quite a common Duck in the neighbourhood of Calcutta during the cold weather. The Falcated Duck, or Bronze-capped Teal (*Eunetta falcata*), was once considered a great rarity, and, though now by no means common, appears occasionally in some numbers. My friend Mr. C. M. Inglis obtained no fewer than seven in Darbhanga during the cold weather of 1900-01, and Mr. Mackenzie, in the same season, procured four specimens from Chupra, and seven were seen in the Calcutta market by Mr. Finn. Previous to this very few had been obtained. The female of this Duck closely resembles the female of the Gadwall (*Chaulelasmus streperus*), and may often be overlooked on this account. The Clucking Teal (*Nettion formosum*) is another very rare species, which belongs really to Eastern Siberia, China, and Japan, and its visits to India are few and far between. The first recorded Indian specimen appears to be a female procured by Blyth in

Calcutta in 1844; Mr. Barton procured a male in Guzerat in 1898; Mr. Barker shot another at Jaipur in 1899, and Mr. Mackenzie another male in the Sarum district in the cold weather of 1898-99; and Mr. Finn a female at the same time in Calcutta. The young males and females may perhaps be overlooked, and thought to be the Common Teal (*N. crecca*), which they somewhat resemble. Another thing with regard to rare Ducks is that so few sportsmen are naturalists, and if one did happen to shoot a rare bird he would not know what it was, and it would go the way of all other fowl, and be eaten.

The beautiful little Mandarin Duck (*Aix galericulata*) was recorded from India for the first time by Mr. Stuart Baker (J. Bomb. N. Hist. Soc. xiv. p. 626 (1902)). As this is a most interesting record, I shall reproduce his note in full. He says:—"To Mr. Stevens, of the Rungagora Tea Estate, in Dibrugarh, belongs the honour of obtaining the first Indian specimen of the Mandarin Duck. The bird, an extremely fine female, was one of a party of six, and was shot in a small backwater close to the estate. Unfortunately Mr. Stevens, not knowing the value of what he had shot, made no attempt to get further specimens. Mr. J. F. Greening and I saw a party of six of these Ducks in July, 1901, flying across the Subansiri River, close to its junction with the Ranganadi. We had no gun out at the time, so failed to get any specimens, but I have no doubt about their identity." The Mandarin Duck is often kept in captivity in India, specimens being imported from China; so it is quite likely those recorded by Mr. Baker may have been escapes, as it seems impossible that this Duck could have been overlooked by the numerous Indian ornithologists, as the male of this species is one of the most conspicuous and beautiful of all waterfowl. This Duck is resident in China and Japan.

The Eastern Spot-billed Duck (*Polionetta zonorhyncha*) is another species lately obtained within Indian limits, and has been recorded from Kentung, South Shan States, and Assam. This bird, together with the Common Spot-bill (*P. pacilorhyncha*), has been classed by most writers on Indian ornithology with the Mallard under the genus *Anas*, and, to my mind, wrongly. Though agreeing with the Mallard in some respects, they differ widely in others. In the first place, in the true

Mallards, the sexes are different ; in the Spot-bills they are undistinguishable ; and in the second place, whereas the Mallards are migratory, the Spot-bills are resident, and I agree with and follow Mr. Oates in separating them.

Now I am on the subject of nomenclature, I might as well say that the popular names of some of the Indian Ducks are misleading. We have "Whistling Teal" and "Cotton Teal," which are not Teal at all, and I should suggest for the former the name Tree-Duck as being much more suitable, as these birds (*Dendrocygna javanica* and *D. fulva*) both nest and perch on trees. As for the Cotton Teal (*Nettopus coromandelianus*), it is difficult to know what name to call it by, as Jerdon's "White-bodied Goose-Teal" is as bad, and quite as misleading ; so the name it has always gone by will have to stand for the present. It is a pretty little Duck, and quite one of the commonest of the Indian *Anatidæ*, and I have seen it in some places in thousands. It has a curious cry, which has been likened to "fix bayonets." No true sportsman would waste a cartridge on them, as they are quite unfit to eat. Common as the bird is, I never came across its nest ; neither did any of my numerous native collectors.

The Shoveler (*Spatula clypeata*) is another Duck that is often condemned as being uneatable (though my experience was exactly the reverse), as it is said to be a foul-feeder. If this be the case, then nearly *all* Ducks are more or less unclean feeders, and therefore not fit for food ; the Mallard (*Anas boschas*), for instance, is a gross feeder, and nothing comes amiss to its hungry maw, and yet it is pronounced to be *the* Duck for the table.

The Common Teal (*Nettium crecca*) occurs in countless numbers, in some places only being outnumbered by "Whistlers," "Cotton" Teal, and Garganeys (*Querquedula circia*). I happened one day, with two other guns, to be on the look-out for something to shoot, when word was brought to us by some natives that a large quantity of Teal were feeding in a small creek about half a mile distant. When we got near the place a confused murmur of sounds reached my ears, but no Teal could I see ; when all at once the whole flock rose, and what I had taken for mud was one vast living mass of Teal. We made a grand bag that time.

One year when I was in Bengal the rice-crop was seriously

damaged in some places by Pintails (*Dafila acuta*), which came at night to feed on it. These Duck, together with the Gadwall, were very common that year (1897).

It has often been explained before how the natives of Bengal snare Duck, but this method will bear one more repetition. In the middle of a big sheet of water nets are fixed between two poles, and allowed to hang rather loosely. On dark nights the Duck, flying low over the water, go right into the nets, and get entangled; thus they are found in the early morning, and taken away to be sold in the bazaars. Another very ingenious way the fowlers have of catching them is by means of birdlime, but this can only be done when the Duck are feeding near the edge of the water. The fowler first of all provides himself with a large screen made of leaves and grass. This he carries in one hand; in the other he has a number of bamboos that can be jointed together like a fishing-rod, the last joint being very thin and forked at the end; this being smeared with birdlime. Hiding himself behind the screen, he crawls to the water's edge, and one by one very cautiously joints the pieces of rod together, gradually pushing them all the time near to the flock of Duck. When he thinks he has got near enough he gives the rod a sharp twist, and the sticky limed ends catch in the bird's plumage. He then drags the bird to him, and slips it into a closed basket slung at his side. It is surprising how little notice the other Ducks take of this proceeding, and I have seen a clever fowler catch several one after the other before the rest of the flock were aware of what was taking place. Even birds as wary as Grebes and Herons are caught this way.

Most of the migratory Ducks arrive in India at the end of October, though I have notes of very early arrivals. I once saw in Bengal a flock of Gadwall on Aug. 20th, and I have shot Garganeys in July. This looks very like as if some of these remain to breed in India, and I am certain they do so at times. When we consider the vast country we have to deal with, it is not surprising that nests are overlooked even by the most careful observers; otherwise, how can one account for quite young birds (especially Garganeys) that are shot in summer, and there is no reason why some should not breed in localities especially suited to their habits.

The curious Stiff-tailed Duck (*Erismatura leucocephala*) must, I think, be a resident where it is found, as its very short wings render it incapable of long flights. There are only nine records, however, of its occurrence in India up to the present time. It ranges from the Mediterranean to Central Asia.

The Ducks that are resident and breed in India, including the Stiff-tail, which we will suppose to be resident, are ten species. These are the "Whistling Teals" (*Dendrocycna fulva* and *D. javanica*), "Cotton Teal" (*Nettopus coromandelianus*), Pink-headed Duck (*Rhodonessa caryophyllacea*), Comb-Duck (*Sarcidiornis melanonota*), Wood-Duck (*Asarcornis leucoptera*), the two Spot-bills (*Polionetta pæcilorhyncha* and *P. zonorhyncha*), Andaman Duck (*Nettium albigulare*).

While the migratory Ducks and occasional visitors are twenty-two. These are the Common Sheld-Duck (*Tadorna cornuta*), Ruddy Sheld-Duck (*Casarca rutila*), Common Teal (*Nettium crecca*), the Clucking Teal (*N. formosum*), Garganey (*Querquedula circia*), Falcated Duck (*Eunetta falcata*), Wigeon (*Mareca penelope*), Pintail (*Dafila acuta*), Gadwall (*Claulelasmus streperus*), Shoveler (*Spatula clypeata*), Mallard (*Anas boschas*), Marbled Duck (*Marmaronetta angustirostris*), Red-crested Pochard (*Netta rufina*), Pochard (*Nyroca ferina*), White-eyed Pochard (*N. nyroca*), Green-headed Pochard (*N. baeri*), Scaup (*N. marila*), Tufted Duck (*N. fuligula*), Golden-eye (*Clangula glaucion*), Goosander (*Merganser castor*), Red-breasted Merganser (*M. serrator*), Smew (*Mergus albellus*).

THE TAWNY PIPIT (*ANTHUS CAMPESTRIS*) AS A VISITOR TO ENGLAND.

BY MICHAEL J. NICOLL, M.B.O.U.

It is now forty-six years since the Tawny Pipit was first discovered to be an occasional visitor to England by the late Mr. G. Dawson Rowley. The first example was taken at Shoreham Harbour, in Sussex, on Aug. 15th, 1858; since which date, up to 1890, twenty-two have been recorded from England, out of which number nineteen were shot or caught in Sussex—and all within the neighbourhood of Brighton—in August, September, and October, and one in November. Now, on first thoughts, it would seem to be curious that all these were obtained at or near Brighton, but there are two reasons for this, which must be taken into consideration. In the first place, Sussex is the most likely county for this bird to visit on its migration southwards in autumn, as it breeds just across the Channel—in Northern France, for instance—and nothing is more probable than that a few individuals should become separated from the main body, and, crossing the English Channel with other birds—Meadow-Pipits, for instance—should alight on the coast of Sussex.

Every autumn I have watched Meadow-Pipits (*Anthus pratensis*) coming in over the sea from the south, and settling on the marshes and shore; also it has been stated by Mr. Eagle Clarke ('Ibis,' January, 1904, p. 136) that the immigrant Meadow-Pipits pass the Kentish Knock lightship from the east and south-east in October. It is probable that the Tawny Pipits come across with the former species of Pipit, and my own observations, which I shall mention later, tend to confirm this idea.

The second and strongest reason why *Anthus campestris* should have been taken near Brighton between the years mentioned, i. e. 1858–87 (in the latter year the last specimen recorded from Sussex prior to 1903 was taken) is that during that time

there were several keen ornithologists on the watch for rare migrants in that locality, of which Mr. Rowley was one.

The only examples of this species recorded from other parts of England are three in number—namely, one at Tresco, Scilly Islands, September, 1868; one at Bridlington, Yorkshire, Nov. 20th, 1869; and one near Lowestoft, Sept. 2nd, 1890 (Howard Saunders, 'Man. Brit. Birds,' 2nd ed. p. 137). Now the first of these, which was taken in the Scilly Islands, had probably arrived on the Sussex coast, and, following the coast-line, had reached the Scilly Islands. This, of course, is only supposition, but it is most likely to have been the case. The second, shot in Yorkshire, had perhaps been driven up from the south coast by a gale, and delayed by contrary winds, and the time of its capture, *i. e.* November 20th, seems to show that this was the case. As regards the example from Lowestoft, however, there can be little doubt that it came *via* Heligoland, possibly from Sweden. Gätke ('Birds of Heligoland,' p. 347) states that an example may be met with now and again on fine days in August. Now, as the Lowestoft bird was obtained on Sept. 2nd, it would, by travelling in a south-westerly direction, have reached that place about this date.

Turning to later years, we see that, now greater attention is being paid to rare autumnal stragglers in this district, *i. e.* East Sussex, the Tawny Pipit has been found to occur here quite as frequently as it was found to do in West Sussex, and seven examples have been shot here during the last two autumnal migrations. I now give a short account of these instances.

On Sept. 22nd, 1903, a day on which countless numbers of Meadow-Pipits were arriving from the south, coming in from the sea, and settling on the shore, I shot a pair of immature Tawny Pipits. Two days later, during the same conditions, I shot another immature pair of the same species. Of course, these four may have arrived together.

The first immigrant Meadow-Pipits arrive on our south coast of Sussex during the first two weeks of August. On Aug. 14th and 17th of this year (1904) two adult Tawny Pipits were met with near here. Lastly, on Sept. 26th of this year, I shot a young Tawny Pipit on the sea-banks near Bexhill. On this day also I noticed a great many newly-arrived Meadow-Pipits, and

numbers of the latter species were arriving all the morning in small parties.

In conclusion, I must say that I think there is no doubt that the Tawny Pipit is a regular autumn visitor, in small numbers, to the coast of Sussex, as the results show that, when attention has been drawn to this bird, it is found nearly every year.

Those examples I have met with have been very shy, and the inconspicuous immature plumage and soft Bunting-like chirp, which seems only uttered when the bird is alarmed, are not likely to attract attention unless one is looking carefully for these and similarly rare wanderers. I now give a list of the previous years in which this species has been met with in Sussex :—

- Aug. 15th, 1858. The first British example.
- Sept. 24th, 1862. One.
- Sept. 1864. One.
- Sept. 1869. Two. One shot at Bridlington, Yorkshire,
in this year.
- Sept. 1870. One.
- Oct. 1873. One.
- Nov. 1874. One. A very late arrival.
- ? 1874. One.
- Oct. 1875. One.
- Oct. 1876. One. Not mentioned by Borrer.
- Sept. 1877. One.
- Oct. 1882. One. Not mentioned by Borrer.
- Oct. 1886. Three.
- Aug. 1887. One.

Besides these, Mr. Borrer ('Birds of Sussex,' p. 105) mentions that he has three in his collection, taken near Brighton, but he does not give the dates.

NOTES AND QUERIES.

MAMMALIA.

Hybernation of the Noctule Bat.—Living in the immediate neighbourhood of the River Severn, over the course of which waterway the Noctule may be very commonly observed, I have been able to carefully notify during the present year the first and last appearance of this species. The first seen on the wing was on Feb. 22nd, an exceptionally early date, the next not being observed until March 21st, after which date they became common. Oct. 26th was the last date, when several were seen during the one evening, and on Nov. 1st (Nov. 11th in 1908), a solitary one observed. This leaves only the two months of January and December in which the species was not noted.—J. STEELE-ELLIOTT (Dowles Manor, Worcestershire).

Pale-coloured Himalayan Bear.—With reference to the notice (*ante*, p. 222) of a cream-coloured Himalayan Black Bear (*Ursus torquatus*) living in the Amsterdam Zoological Gardens, and as light-coloured Bears of this species would seem to be of very rare occurrence, it may be of interest to record that in Kashmir, on Sept. 8rd, 1890, I shot a female Black Bear, which was accompanied by two cubs, each about four months old, both of which were secured alive. One was of the normal colour, but had unfortunately to be destroyed, owing to an injury received during capture; the other one was of a very light brown colour, which probably would have turned lighter with age; the claws were of a light horn-colour, and the eyes were pink like an albino's. It had the white horseshoe mark on the chest, and with the exception of colour conformed in every way, as far as could be seen—such as the texture of the pelage, size and shape of claws, &c.—to an ordinary Black-Bear cub. The young Bear in question had to be left in Kashmir on my return to the plains, and, as I left India shortly afterwards, I never ascertained what eventually became of him. In 'The Zoologist' (1899, p. 816) an albino Bear of this species is recorded as living at that time in the above mentioned Gardens.—H. MEYRICK (Clevedon, Somerset).

Pine Marten (*Mustela martes*) in Furness.—About May 18th, 1902, a "Sweetmart" was caught in a Rabbit-trap in the Rusland

Valley. It was old female; extreme length, 26 in. I believe another was killed in the neighbourhood about the same time. Until this occurrence I had never been able to hear even a tradition of either the "Sweetmart" or the "Foumart" having visited the Valley.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

Grey Seal (*Halichærus grypus*) in the Wash. — Dr. Plowright, of Lynn, informed me that a baby Grey Seal, with the umbilical cord still adhering, was found alive, but floating exhausted, in the Wash off Skegness, and brought to Lynn in November, previous to the 5th; it lived for three or four days. The length was 39 in. I fear this little one was merely meeting with the fate of all the young ones of this species born on the sands of the Wash, none of which in all probability escape drowning.—T. SOUTHWELL (10, The Crescent, Norwich).

AVES.

Curious Variety of the Robin (*Erithacus rubecula*).—A Robin was shot at Barton, near Bury St. Edmunds, in October last, in very remarkable plumage, and was in due course sent to Mr. Travis, the local birdstuffer, for preservation, in whose shop I saw it after it was mounted. The upper parts, instead of being of the usual olive-green colour, were dark slaty-blue, and the lower parts white, with the exception of a few red feathers on the breast.—E. A. BUTLER (Plumton House, Bury St. Edmunds).

Late Appearance of Blackcap in Leicestershire.—While walking on the outskirts of Leicester, near the village of Evington, on Oct. 17th, I saw a male Blackcap (*Sylvia atricapilla*) in a hawthorn hedge, near a small plantation. The bird seemed to be alone. Is not this a late date for Blackcap in Leicester? — T. N. ROBERTS (88, West Bank, Scarborough).

Breeding Habits of the Pied Wagtail. — Besides the instances mentioned in my paper on this subject (*ante*, p. 421), Mr. H. Stevenson has recorded, in 'The Zoologist' for 1875, p. 4291, a Pied Wagtail's nest built into a deserted Song-Thrush's nest in a laurel-bush in Norfolk; and Mr. J. H. Gurney, Jun. (Zool. 1876, p. 5008) mentions a case where a Pied Wagtail built in an old Blackbird's nest at Reigate, and refers to an instance of the same kind in Norfolk (possibly that recorded above). It is probable that this habit is common to the continental representative (*M. alba*), for Mr. H. J. Pearson, in his 'Three Summers among the Birds of Russian Lapland' (p. 148), describes a

nest of this bird with five eggs inside an old Fieldfare's nest.—F. C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

Serins at Dover.—On Nov. 16th I received a live Serin (*Serinus hortulanus*), which had been caught a few days before by a birdcatcher at Dover, and I have since heard that a second example was taken at the same place on the day I received mine. Both these birds were associating with Linnets.—D. SETH-SMITH (Canning Road, Addiscombe, Croydon).

Cirl-Bunting in Worcestershire and Shropshire.—During the past summer, from April 24th onwards, I have frequently heard the song of the Cirl-Bunting (*Emberiza cirlus*) in this neighbourhood. So far I have been able to locate probably three pairs of this species—one on the Wribbenhall side of the River Severn, another near Dowles Church (both of which localities are in Worcestershire), and still more frequently one was heard singing on the open land to the north of my house, which is within the Shropshire boundary.—J. STEELE-ELLIOTT (Dowles Manor, Worcestershire).

Starling (*Sturnus vulgaris*) building in November.—That this well-known species will sometimes rear two or three broods in a season has been commented upon more than once in these pages, but the following note may be of interest. In the early part of the season a pair of Starlings nested in a hole near one of the chimneys of this house, and almost as soon as the young were able to fly either the same or another pair of birds built in the same position, and successfully reared a brood. For a week or two after this second family was able to leave the nest the place seemed deserted, but early this month (November), at the dawn of day, I heard the long-drawn sighing love-song, as well as that gurgling sort of twitter—reminding one of dripping water—so indicative of spring-time, and the most casual observation revealed the fact that nesting operations were again in progress, the old building being repaired with portions of straw, &c., that had fallen upon a roof beneath; but the most remarkable part of it was that one of the birds—which, from its singing, I supposed was the male—was in the grey garb of immaturity. It might have been a precocious scion of one of the earlier broods, but is it usual for the species to breed while in the "solitary Thrush" condition of plumage? I believe eggs were laid, and the hen was "sitting," as I several times watched the grey bird visit the nest-hole, as if with food in its beak, and once or twice I saw the darker one leave the place quickly and soon return. The probability is that the severe frosts of the last few nights would have been an

insuperable difficulty to successful nidification, but I regret to say the interesting observations were cut short, much to my annoyance, by a neighbour's mischievous lad, who killed both birds with an air-gun. It is pleasant to know that this handsome but common species is rather on the increase than otherwise. I have been informed it is much more abundant in the forest than it was some years ago, and that the holes excavated in the trees by Woodpeckers are very frequently taken possession of by Starlings. Is it possible that one of the attractions to the locality may be the frequently enormous quantity of that most destructive little larva of the green oak-moth (*Tortrix viridana*), of which the birds are said to be very fond? Everyone who has visited the forest must have noticed the ravages wrought by those puny creatures, the oak-trees at times being entirely stripped of their foliage, and looking almost as bare as in mid-winter. The autumnal habit of the Starling of sometimes hawking for insects—Swallow-like—high in the air has often been recorded, and on more than one occasion it has been erroneously brought to my notice as an instance of the late stay of some of the Swallow tribe. — G. B. CORBIN (Ringwood, Hants).

Tropical Woodpeckers and Fireflies.—Some time previously I privately made mention of a subject which seems to me to possess a certain amount of interest, *i. e.* Do the Woodpeckers of tropical countries feed upon the numerous fireflies and luminous beetles to be found in almost all hot climates? During my recent trip in the West Indies, and while staying at the village of Mandeville in Jamaica, I was much struck by the countless numbers of fireflies moving about the trees after dusk, and at the same time I distinctly heard the "tap-tap-tap" of the Woodpeckers. The most plentiful Woodpecker is *Centurus radiolatus*, one of which I obtained, although *Picus varius* is stated by Gosse to be found occasionally in the months of January, February, and March. If these Woodpeckers feed upon fireflies, then the light displayed by the latter must surely lead to their presence being discovered by the ever-watchful Woodpecker, and be a great source of danger to them. — D. A. BANNERMAN (High Croft, Westerham, Kent).

The Roller (*Coracias garrulus*) in Hants.—Several times during last summer—from May to July—I heard of one or more of what I supposed was this rare and beautiful species having been seen, but delayed recording the fact until I was certain of its identification. A gentleman of unimpeachable authority and observation has kindly informed me that he saw, upon his own lands, a strange bird, on one

occasion in close proximity to a couple of Jays, whose voice and actions were very different from the visitor. A glass revealed that the stranger was a Roller, and on following days he saw it several times, and much nearer; so there was no mistaking it. About the same time the coachman in the gentleman's employment also saw another—or it might have been the same bird—in quite a different part of the estate, and knew it at once by the figure in Lord Lilford's grand book. This, I believe, was in July, after which the bird or birds were not seen again, and I have not heard of this lovely species having been slaughtered elsewhere; as long as it stayed upon the estate of the gentleman who saw it, it had the kindly protection it deserved.—G. B. CORBIN (Ringwood, Hants).

Shoveler in East Lothian.—On Nov. 19th my friend Mr. Robert Whyte and myself were greatly interested in watching a Shoveler drake (*Spatula clypeata*) near Morrison's Haven, on the East Lothian foreshore. The bird was in company of a dozen Mallard, and the party kept near the shore. Although the Shoveler has been found nesting in East Lothian, it is by no means a common bird in that county as yet.—HENRY D. SIMPSON (52, Queen Street, Edinburgh).

Habits of Willow-Grouse.—In rejoinder to the reply on this subject by Mr. Einar Lönnberg (*ante*, p. 480), I can only say that if the Willow-Grouse never perches on trees or shrubs where observed by Mr. Lönnberg, in summer, when the ground is bare of snow, the habit of the birds on north-eastern Russian tundras is *different*, and Willow-Grouse can be seen constantly sitting on the low willow-scrub, especially where an extensive view can be obtained; and that *in summer*. Of course I am not referring to Mr. Lönnberg's remarks strictly confined to young hybrids. I presume Mr. Lönnberg *means* to express that "young hybrids, when scared, perched in trees as the (*young*) Blackgame does, but not as the (*young*) Willow-Grouse does." I am willing to modify my statement—"seen scores of Willow-Grouse perch on trees," and substitute "seen Willow-Grouse scores of times perch on trees and willow-scrub." The time I and Seebohm saw them perching on trees or scrub on the skirts of the tundra, and in the willow-scrub at the little lakes on the tundra, was *after the snow was all gone, and all the river-ice floated away*. But it may be recalled by some of your readers that we saw stranger facts than Willow-Grouse perching on trees. We saw and recorded Snipe on top of a Petchora larch, and Gulls, Curlews, Snow-Buntings, Meadow and Red-throated Pipits perching constantly, a habit learned (or induced) by the flooding of the

left banks of northern rivers in Russia and Siberia.—J. A. HARVIE-BROWN.

Spotted Crake in Furness.—In 'The Zoologist,' 1898, p. 479, I recorded the occurrence of three Spotted Crakes (*Porzana maruetta*) in the Rusland Valley. On Oct. 4th this year another was shot in the same small swamp from which the other three were obtained. This bird is now in the Tullie House Museum, Carlisle, and it may perhaps be worth recording the fact that the Furness examples of the Little Crake and Baillon's Crake, mentioned by the late Rev. H. A. Macpherson in the 'Fauna of Lakeland,' are now in the same collection.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

Quail in Suffolk.—Whilst shooting on the Brockley Hall Farm, near Bury St. Edmunds, on Oct. 18th, I flushed a Quail (*Coturnix communis*). It rose at my feet, and flew all around me, settling again in a hedgerow. I did not shoot it, knowing the bird well, and having specimens already in my collection. The above date seems rather late for a bird of this species to be found here. I saw some eggs that were taken near Fakenham in Norfolk four or five years ago.—E. A. BUTLER (Plumton House, Bury St. Edmunds).

Late Stay of Golden Plover (*Charadrius pluvialis*) in Warwickshire. It is well known that these birds are frequent visitors to Warwickshire during the winter months, but last year (1908) a pair stayed abnormally late on some marshy ground near a small river within ten miles of the city of Birmingham. I first heard and saw one of them on April 17th, but the tenant of the land and the keeper in charge of the shooting had observed them about the neighbourhood for some weeks previously. The last date on which I myself heard them was May 7th, but the tenant noticed them until May 18th, this being the last day on which they were seen. Towards the close of their visit they became very tame, and, although I believe the change to breeding plumage is common to both sexes, yet only one of them was showing a dark colour on the breast. I am not aware of there being any book on the birds of Warwickshire, though Mr. Steele-Elliott, in his 'Vertebrate Fauna of Sutton Coldfield Park (Warwickshire),' only mentions Golden Plover as occasionally passing over on their migratory movements; while Mr. Aplin, in his 'Birds of Oxfordshire,' states that April 7th is the latest date in spring on which he has known Golden Plover to appear (in that county). I do not know what the record is in Northamptonshire, as I have not the late Lord Lilford's books to refer to.—A. H. ETCHES (Meriden, near Coventry).

Red-necked Phalarope in Shropshire and Merioneth.—I recently identified, at the local taxidermist's, a specimen of the Red-necked Phalarope (*Phalaropus hyperboreus*), which was shot, Nov. 1st, on a small pool at Boreton, near Condover, about five miles south of Shrewsbury. It is an adult in winter plumage, with no trace of red on the neck, and was taken at first for a Grey Phalarope. The small size and slender bill, however, prove its identity beyond a doubt. The occurrence is of interest as being the first authentic instance in Shropshire. At the same time I was shown another specimen—an immature bird—of the same species, which had been obtained at Towyn, Merioneth, in the autumn of 1902, just about a year later than the example recorded in 'The Zoologist,' 1901, from the same locality. H. E. FORREST (Bayston Hill, Shrewsbury).

Terns in Orkney.—It seems that naturalists are still somewhat doubtful as to whether the range of the Common Tern (*Sterna fluvialilis*) in Great Britain extends so far north as the Orkney Islands; many assert that north of the Pentland Firth it is entirely replaced by the Arctic Tern (*S. macrura*). In reference to the distribution of the Common Tern in the British Isles, Mr. Saunders writes—I quote from Dr. Bowdler Sharpe's 'Handbook of British Birds,' vol. iv. p. 19: "Broadly speaking, I believe that the Common Tern is the predominant species along the shores of the Channel, and on the west side of Great Britain as far north as the Isle of Skye; while on the east it is found from Kent to the Moray Firth. Continuing northwards, we find it yielding numerically to the Arctic Tern. I have no conclusive evidence of the occurrence of the Common Tern in the Shetlands, Orkneys, or Outer Hebrides." From personal observation made this summer while on a visit to the Orkney Islands, I am able to definitely state that the Common Tern is distributed in large numbers among these islands, being almost as plentiful as the Arctic Tern. On Aug. 23rd I shot a single adult bird from a large colony of Terns in the neighbourhood of Kirkwall, and again, on Aug. 29th, I shot one from a colony at sea, some twelve miles north of Kirkwall; both of these birds I identified as being specimens of the Common Tern, the tarsus being longer than is the case with the Arctic Tern, the bill also being longer and tipped with black. The skins of these birds are now in my collection. — J. G. JEFFREYS (Junior Conservative Club, Albemarle Street, W.).

Buffon's Skua (*Stercorarius parasiticus*) in Somerset.—A Skua was shot at Axbridge on Oct. 19th, 1903, and sent in to Wells for preservation. I examined the bird, and thought it was Buffon's Skua.

I sent it to South Kensington Museum on Oct. 27th, where Mr. Howard Saunders pronounced it Buffon's Skua, without doubt. This specimen was shot just after the terrific gale of this month, which somewhat coincides with those killed during the great storms of October, 1879 (Saunders's 'Manual'). I consider this a rare occurrence, and should be pleased to hear of any other Somerset-taken birds.—STANLEY LEWIS (Mount Pleasant, Wells, Somerset).

Notes on Swiss Birds.—On reading the Rev. C. W. Benson's notes on Swiss birds, I thought perhaps my notes, made at Clarens, a few miles nearer the Rhone Valley, in October, 1897, might be of interest. I have put them down somewhat in the order of their abundance:—Black-headed Gull, Chaffinch, Nuthatch, Blackbird, Blue Tit (all very common), Grey Wagtail (common), Jay, Magpie, Crow (all very common), Green Woodpecker, Great Spotted Woodpecker (both common), Great Crested Grebe, Little Grebe (six seen), Tree-Sparrow (one flock), White Wagtail, Siskin, Goldfinch (common), Bullfinch (only one seen), Starling, Pipit (? species), Great Grey Shrike (November to end), Marsh-Tit, Ring-Ouzel, Long-tailed Tit (two family parties). On Oct. 27th I saw a species of Sandpiper feeding on the stones round Lake Lemman (which we improperly call the Lake of Geneva) for half an hour. It was very tame; it was like a Dunlin, only smaller, with a grey head, speckled back, white breast, and a long bill like a Snipe. I did not see, during my five weeks' stay, a Hedge-Sparrow, Thrush, Linnet, or Lark. There is a very large number of Mute Swans on the Lake. I saw one Nutcracker at Glion, which is above Montreux.—GEORGE W. BRADSHAW (Hill Road, Sutton, Surrey).

Modern Egg-Collecting.—I was very interested in reading Prof. J. H. Salter's remarks on the above (*ante*, p. 438). This imposition has been going on for some time, collectors paying ridiculous prices for continental eggs, thinking they are in possession of "rare British-taken clutches." Why is it that some British-taken (?) clutches of rarities go so cheaply at Stevens's Auction Rooms, sometimes not realizing a penny more than foreign-taken ones: are the data-tickets fakes? There is always a doubt attaching to so-called British-taken eggs. Mr. Salter mentions the unfortunately high prices obtained for "well-authenticated clutches." Of course he refers to those having good data, with perhaps an eminent naturalist's name attached; these are pretty well known, and no doubt come under the hammer again and again as the various collections are broken up; but the collector who to-day buys illegal unblown British rarities in the belief that they

will in years increase in value is making a great mistake, for he dare not exhibit a data-ticket with them, and when they come under the hammer, who could be found to pay more than foreign price for them? The attention of the Society for Protection of Birds should certainly be called to Mr. Salter's remarks on the Ravens, Kites, and Buzzards in mid-Wales, with a view to having paid watchers there, Moral: do not buy rare British-taken eggs; they may be spurious. If genuine, no one will readily believe it. — STANLEY LEWIS (Mount Pleasant, Wells, Somerset).

NOTICES OF NEW BOOKS.

The Mammals of Great Britain and Ireland. By J. G. MILLAIS, F.Z.S. Vol. I. Longmans, Green & Co.

In the literature devoted to our British fauna this sumptuous volume may be said to have reached the high-water mark, and to have raised the study of our insular Mammalia in a very appreciable degree. Such a book was long wanted, and it is no offence to previous publications to say that it has appeared in the fulness of time; other writers will find themselves assimilated and quoted in these pages, many almost forgotten observations have been reprinted, and a careful research has been made through most mammalian records relating to our fauna. Besides which Mr. Millais is sportsman and naturalist, and we read that Mr. Harting also handed him over his notes which had been collected with the idea of a similar enterprise. Consequential on these advantages alone the letterpress is thoroughly up to date, while the author has very much to detail from his own studies and observations. The great advantage of a faunistic book written fully up to present information, is not that it shall be accepted as the last word on the subject, but rather that it creates an enthusiasm to add still more to a knowledge that is for the time amply recorded; and although it would of course be absurd to say that everything is incorporated in this first instalment of three massive volumes—and, like Charles Lamb, we love large editions—many naturalists will be incited to record an observation which they can at least be sure “is not in Millais.”

Our mammalian fauna is now somewhat of a vestige, and although few of the enthusiasts will be found who, we are told, suggest that Wolves might be re-introduced, and their depredations paid for “out of the rates,” still most naturalists would pay a very high price indeed to gaze for only once on the Pleistocene mammals of these islands; in fact, the feeling often

arises that, as naturalists, we would fain have bartered "the fifty years of Europe" for a life in the cycle of a prehistoric fauna, and, even more recently, to have hunted the Wolf and Boar rather than have lived within sound of a factory bell. Mr. Millais includes those mammals which have become extinct with us during historic times; to have done otherwise would be equivalent to excluding *Beowulf* from the annals of British literature.

We cannot, however, linger over the text of this book, for the illustrations reach a standard seldom found in zoological publications, and sometimes arouse those æsthetic appreciations which are often denied as belonging to the professors of a gospel of dry bones and skins. In some of the photogravures from original drawings by the author, especially in that of "Water Shrews at play," many will recall the touch "of a vanished hand," while the names of Archibald Thorburn and G. E. Lodge are impress to the other work. In fact, the illustrations for a portfolio alone are more than worth the price of the whole book.

We have endeavoured to give the salient features of this volume; it would be beyond our space and province to seek to dissect it; as a welcome contribution to our faunistic histories, written with such thoroughness and adorned with such attractive illustrations, we cease to be critics, and feel that, thus disarmed, our occupation's gone. Misprints are almost absent, though the *reader* has allowed the name of the author of 'Gleanings in Natural History' to appear as Mr. "Jess."

Ants and some other Insects; an Inquiry into the Psychic Powers of these Animals. By Dr. AUGUST FOREL. Translated from the German by Prof. W. M. WHEELER, of New York. Kegan Paul, Trench, Trübner & Co., Ltd.

THIS is a tractate of some fifty pages written, and published on the philosophical question as to the community, or divergence between the mental, or psychic capacities of men and other animals. For this purpose Dr. Forel has contributed many facts relating to Ants, about which he has such a special knowledge,—creatures which differ so immensely from man in size,

and yet possess such an affinity to him in domestic polity consequently this publication is rather a contribution to the study of comparative animal psychology than a purely entomological treatise.

On the vexed polemical question, which was focused in the advocacy of Descartes, that animals, *excluding man*, are simply automata, and which has been carried on by Bethe, Uexkull, and other recent authorities, who propose the view that the invertebrates have no psychic powers, and are merely reflex-machines, Dr. Forel advances his own conclusions based on the evolutionary conception. He considers that "all the properties of the human mind may be derived from the properties of the animal mind"; and further, that "all the mental attributes of higher animals may be derived from those of lower animals. In other words, the doctrine of evolution is quite as valid in the province of psychology as it is in all the other provinces of organic life." However, this question is of too burning a nature to be discussed adequately in these pages, or we should soon find ourselves in the theological arena. Whether man has benefited by regarding other animals as simply "beasts which perish" is at least non-proven; though it seems absolutely certain that the idea has not increased man's forbearance with, and in, the lives of other creatures. The opinion also has probably little warrant, even in that domain of thought from which it more frequently emanates, and will most likely disappear as our ideas widen; if it originally came from the near East, it has now crystallized into a western conception, but has never been held by myriads of the Orient. Dr. Forel, in a very pregnant paragraph, writes:—"Spoken and especially written language, moreover, enable man to exploit his brain to a wonderful extent. This leads us to underestimate animals. Both in animals and man the true value of the brain is falsified by training, *i. e.* artificially heightened. We over-estimate the powers of the educated negro and the trained dog, and underestimate the powers of the illiterate individual and the wild animal."

The zoologist will find as an Appendix a valuable contribution on "the peculiarities of the olfactory sense in insects."

Ianto the Fisherman and other Sketches of Country Life. By
ALFRED W. REES. John Murray.

WE have now a plethora of books relating to rural life which strive after the method of Jefferies, and might often well be called rhapsodies by lovers of nature; books which may incite the imagination of dwellers in towns, but which give little comfort to an experienced field naturalist. The simplicity of style, and the observational genius of a Gilbert White, or an Isaac Walton, are still ideals not always reached by many writers, and hence the unexpected pleasure of meeting with a volume like the above, which can be read through and through and yet again by anyone who has angled, or shot, with an eye to the inner life of his game. The biographical sketch of the old fisherman who had been a poacher, and another strange individual who was still the poacher, given by one who avows himself their friend, and thus enjoyed their confidence and acquired their lore, is one of the best things done in this path of literature for many a day. We neither meet with the culled essence of many other books, nor condescending observational platitudes by a landed squire; but these two humble individuals are allowed to tell their tale in their own way, and to impart their own self-acquired information by field and flood, while there is so much human sympathy to be found in these pages as to incite a very friendly feeling for the author.

Mr. Rees himself has also his own observations, and we will only refer to one, of which many of us know the truth, but which we think has not been told in print before. In night-fishing for trout, "frequently, between nightfall and eleven o'clock the fish 'come' greedily; also between one in the morning and sunrise. But seldom between eleven and one do I hook a trout." And similar is the experience of the entomologist who "sugars" for moths. "But, as far as my experience goes, not a moth is 'pill-boxed' between eleven and one o'clock, unless perhaps it be some poor fellow whose love delayed him over-long. About one, or half-past one, the soft-winged gadabouts return to the flowers and the tree-trunks, and the Bat is back above the moon-mirror of the pool."

There are a few illustrations; that of "the keeper's cottage" is a lovely photograph.

Scribblings of a Hedgerow Naturalist. By J. WHITAKER.
Walter Black & Co., Ltd.

THIS is a book of natural history observations addressed in an epistolary manner to Mr. O. V. Aplin, and contains much interesting information. Mr. Whitaker, as a man of leisure, appears to have kept his eyes very open while enjoying the privileges of what, to judge from the illustrations, is his very pleasant demesne, and which he refers to on the title-page as "Rainworth Lodge, Notts."

Now that anglers and others are paying much more attention to the natural food of our freshwater fishes, it is well to know that "the Bracken Beetle" is a favourite food for Trout, and that at Rainworth, during the short time of their appearance, the fish "are simply gorged with them." The Beetle thus referred to by Mr. Whitaker is evidently the one known by the colloquial name of "bracken clock," and to entomologists as *Phyllopertha horticola*. On the sometime controverted question of the method of the "drumming" by Snipe, a positive assertion is made as the result of personal observation: "This sound is always made by the bird when flying; just before making it, the bird ascends (often when doing this it calls 'cipik,' 'cipik,' 'cipik'), and when it has got as high as it wants, the tail is spread out and the wings extended, then the bird comes slanting down and the sound is produced. I have watched carefully, but the beak is not open. I am quite certain the sound is produced by the tail and wings." Another record that requires preservation is one related by an old water bailiff as to the habits of Swans on a pond attached to a mill where a number of girls are employed. These girls in fine weather eat their meals on the bank of the dam, throwing bits of bread to the Swans. A bell rings at breakfast and dinner-time, and directly the bell starts the Swans, if near, "swim as fast as they can to the place; if they are at the far end, at the first sound they fly low over the water to the head"; and, as the old man said, they "know what the bell is for as well as the girls." Many similar observations have been made, and they require compilation.

We think Mr. Whitaker is on strong ground in stating that some birds "have a great number of conversational notes amongst

themselves," and he gives instances derived from observations made on Partridges and Swallows. "The notes we generally hear of birds are their songs and their calls of joy and fear; these are always fairly loud; but the conversational notes (as I call them) are always low. But that they convey a meaning, and a clear meaning, from one to another I am certain." And so are we!

We notice the word "Albanism" used at p. 240. Is not this an unnecessary alteration of the word "albinism," as used by Prof. Newton and others, who are safe guides in technical orthography?

Notes on Collecting and Preserving Plants. By STANLEY GUITON.
West, Newman & Co.

BOTANY is of course included in Natural History, and is a necessary companion to zoology. Scarcely any field naturalist can make many observations on animal life without some reference to their environment, in which the vegetation plays so large a part. Few zoologists can name all our indigenous plants at sight, and fewer still those that are found outside our own flora. Such plants therefore require collecting, and this small and inexpensive booklet gives all the information required for that purpose.

EDITORIAL GLEANINGS.

WE have received from the publishers, Adam and Charles Black, three useful books of reference for 1905. They are the well-known 'Who's Who,' 'Who's Who Year Book,' and 'The Englishwoman's Year Book and Directory.' The first-named volume contains over seventeen thousand biographical *pars.*; the second is made up of the tables which were formerly contained in 'Who's Who' itself; while the third contains much useful information, which, if seldom wanted, is at least seldom to be found.

Does the Hare breed in Confinement?—Darwin, having made, with his wonted diligence, all the researches he could on the subject, gives this answer to the question:—"The Common Hare, when confined, has, I believe, never bred in Europe; although, according to a recent statement, it has crossed with the Rabbit." ('Animals and Plants under Domestication,' vol. ii. p. 152.) We have now received from Mr. Thomas Thompson, of Winlaton House, Winlaton, the following most interesting letter on the subject:—

"In your notes of 21st inst. you stated Hares would not breed in confinement. I was pretty certain you were mistaken, but, to be sure, I wrote to my friend Mr. Mann, of Aigle Gill, Cumberland, from whom I received a most interesting letter this morning, a copy of which please find herewith:—

'Aigle Gill, Nov. 28rd, 1904.

'Mr. Thompson. Dear Sir,—I am much obliged for your letter and paper (Newcastle "Journal") with regard to the Hares breeding. We were cutting a field of oats on Aug. 18th, 1900, when I picked up two leverets, just about four or five days old, and brought them home. They were fed at first with milk from a spoon, and afterwards with bread soaked in milk. They thrived and grew well, living in a box for some time, but were afterwards turned into the wire-run in which you have seen them, the run being about fifteen feet by six feet. The doe produced three young ones in 1901, a two and one. Next year she had two young again at two different times. In 1903 she had four young at three times.

'The doe died early this year, and we decided to give the buck his liberty; but he would not leave the place. However, in July, he got out of his run, some wire having become displaced; in the evening he was sitting about, wanting to get in again, when two of our dogs found him, and chased him away over the fields. However, he returned to try and get in three times, but failed to do so; and at last he was hounded off, as I thought, for good. But, thinking he might return at night, I left an opening in the wire of his run, and next morning he was safe at home again; and does not seem as if he wants to go away at all.'—*Newcastle Daily Journal*, Nov. 29th.

A GRAPHIC account has reached Liverpool of an encounter, in the North Atlantic Ocean, with a huge Sperm Whale, as a result of which the Danish schooner 'Anna' was wrecked, and had to be abandoned by the crew, who were rescued in an exhausted condition. The 'Anna' was making the voyage from Iceland to New Brunswick, and was about twenty days out, when on the afternoon of Sept. 28th a Whale was seen spouting some distance in the offing. Shortly afterwards more spouts were shot upwards within a few hundred feet of the vessel, and the Whale seemed to be angrily moving in a circle. As the 'Anna' sailed slowly past, at a speed of about four and a half knots, her crew could easily discern the manœuvres of the monster, which lashed the water furiously with its tail. Suddenly it made a dash for the ship. It came full tilt at a tremendous speed, and struck the vessel amidships with its head. There was a tremendous crash, and some of the crew were thrown off their feet. A hole was stove in the side of the ship below the water-line, and the stem of the vessel was broken. The Whale, however, had received its *coup de grâce*. Its colossal carcass rose slowly to the surface, revealing two big gashes in its head and side, and from its wounds blood poured profusely, dyeing the water all around. The vessel began to leak, and all hands were placed at the pumps, but as the weather grew worse the ship commenced to sink. After thirty-nine hours of continuous exertion it was decided to abandon the 'Anna.' A lifeboat was provisioned and manned, and was on the point of being launched, when it was noticed by the Johnston liner 'Quernmore.' It was early morning, and a gale was blowing, but, after several gallant attempts on the part of the crew of the Johnston lifeboat, the "whalers" were transferred to the 'Quernmore.'—*Daily Mail*, Nov. 1st.

It has been reported to the Cornwall Sea Fisheries Committee, at Truro, that the whole of the drift Pilchard fishery off the south coast of the county was being "held up" by a plague of Dog-fish, and that nearly fifteen hundred fishermen were being deprived of their means of livelihood. One member stated that the fish were as thick as the water was deep, that one shoal would extend for miles, and that not only did the fish eat the whole catch of Pilchards, but nets and ropes and corks. The Committee accepted a notice of motion to appoint experts to consider the whole question.—*Sun, Dec. 2nd.*



